सिविल सेवा (प्रारंभिक) टेस्ट सीरीज़-2024

जब तक आपको यह परीक्षण पुस्तिका खोलने को न कहा जाए तब तक न खोलें

परीक्षण पुस्तिका अनुक्रम

Test Code: P1/P2-2407

परीक्षण पुस्तिका

सामान्य अध्ययन

टेस्ट – 07

C

समय : दो घण्टे **पूर्णांक : 200**

अनुदेश

1. **परीक्षा प्रारम्भ होने के तुरन्त बाद, आप इस परीक्षण पुस्तिका की पड़ताल अवश्य कर लें कि इसमें कोई बिना छपा, फटा या छूटा हुआ पृष्ठ अथवा प्रश्न आदि न हो। यदि ऐसा हो तो इसे सही परीक्षण पुस्तिका से बदल लीजिए।**
2. **उत्तर-पत्रक में सही स्थान पर परीक्षण पुस्तिका अनुक्रम A, B, C या D यथास्थिति स्पष्ट रूप से कूटबद्ध कीजिये।**
3. इस पंक्ति के साथ में दिये गए कोष्ठक में आपको अपना अनुक्रमांक लिखना है। परीक्षण पुस्तिका पर **और कुछ न** लिखें।
4. इस परीक्षण पुस्तिका में **100** प्रश्नांश (प्रश्न) दिये गए हैं। प्रत्येक प्रश्नांश हिन्दी और अंग्रेज़ी में छपा है। प्रत्येक प्रश्नांश में चार प्रत्युत्तर (उत्तर) दिये गए हैं। इनमें से एक प्रत्युत्तर को चुन लें जिसे आप उत्तर-पत्रक पर अंकित करना चाहते हैं। यदि आपको ऐसा लगे कि एक से अधिक प्रत्युत्तर सही हैं तो उस प्रत्युत्तर को अंकित करें जो आपको सर्वोत्तम लगे। प्रत्येक प्रश्नांश के लिये केवल एक ही प्रत्युत्तर चुनना है।
5. आपको अपने सभी प्रत्युत्तर अलग से दिये गए उत्तर-पत्रक पर ही अंकित करने हैं। उत्तर-पत्रक में दिये गए निर्देश देख लें।
6. सभी प्रश्नों के अंक समान हैं।
7. इससे पहले कि आप परीक्षण पुस्तिका के विभिन्न प्रश्नांशों के प्रत्युत्तर उत्तर पत्रक पर अंकित करना शुरू करें, आपको प्रवेश प्रमाण-पत्र के साथ प्रेषित अनुदेशों के अनुसार कुछ विवरण उत्तर-पत्रक में देने हैं।
8. आप अपने सभी प्रत्युत्तरों को उत्तर-पत्रक में भरने के बाद तथा परीक्षा के समापन पर केवल उत्तर-पत्रक अधीक्षक को सौंप दें। आपको अपने साथ परीक्षण पुस्तिका ले जाने की अनुमति है।
9. कच्चे काम के लिये कुछ पत्रक परीक्षण पुस्तिका के अंत में संलग्न हैं।
10. **गलत उत्तरों के लिये दंड:**

वस्तुनिष्ठ प्रश्न-पत्रों में उम्मीदवार द्वारा दिये गए गलत उत्तरों के लिये दंड दिया जाएगा।

(i) प्रत्येक प्रश्न के लिये चार वैकल्पिक उत्तर हैं। उम्मीदवार द्वारा प्रत्येक प्रश्न के लिये दिये गए एक गलत उत्तर के लिये प्रश्न हेतु नियत किये गए अंकों का **एक-तिहाई** दंड के रूप में काटा जाएगा।

(ii) यदि कोई उम्मीदवार एक से अधिक उत्तर देता है, तो इसे **गलत उत्तर** माना जाएगा, चाहे दिये गए उत्तरों में से एक उत्तर सही हो, उस प्रश्न के लिये उपर्युक्तानुसार ही दंड दिया जाएगा।

(iii) यदि उम्मीदवार द्वारा कोई प्रश्न हल नहीं किया जाता है, अर्थात् उम्मीदवार द्वारा उत्तर नहीं दिया जाता है, तो उस प्रश्न के लिये **कोई दण्ड नहीं** दिया जाएगा।

जब तक आपको यह परीक्षण पुस्तिका खोलने को न कहा जाए तब तक न खोलें

***ध्यान दें :* अनुदेशों का अंग्रेज़ी रूपान्तर इस पुस्तिका के अंतिम पृष्ठ पर छपा है।**

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1. निम्नलिखित में से कौन-सा पोषक तत्त्व मानव आहार में ऊर्जा का अधिकतम केंद्रित स्रोत प्रदान करने के लिये ज़िम्मेदार है?

(a) विटामिन *(b)* वसा

(c) कार्बोहाइड्रेट *(d)* प्रोटीन

2. निम्नलिखित में से कौन-सा कथन पारभासी पदार्थों के साथ संपर्क करने पर प्रकाश के व्यवहार का सटीक वर्णन करता है?

(a) प्रकाश को पदार्थ द्वारा पूरी तरह से अवशोषित कर लिया जाता है, जिससे यह अपारदर्शी दिखाई देता है।

(b) प्रकाश न्यूनतम प्रकीर्णन के साथ पदार्थ से होकर गुजरता है, जिससे दूसरी तरफ की वस्तुओं को स्पष्ट रूप से देखा जा सकता है।

(c) प्रकाश पदार्थ की सतह से प्रतिबिंबित होता है, जिससे दर्पण जैसा प्रभाव उत्पन्न होता है।

(d) प्रकाश आंशिक रूप से पदार्थ के माध्यम से प्रसारित होता है, जिससे यह धुँधला अथवा विसरित दिखाई देता है।

3. पृथक्करण की निम्नलिखित विधियों पर विचार कीजिये:

1. थ्रेशिंग
2. निष्पावन
3. वाष्पन
4. निस्यंदन
5. चालन

ठोस और द्रव्य के मिश्रण को पृथक करने के लिये उपर्युक्त में से कितनी विधियों का उपयोग किया जा सकता है?

(a) केवल दो *(b)* केवल तीन

(c) केवल चार *(d)* सभी पाँच

4. प्रकाश संश्लेषण के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. यह प्रकाशीय ऊर्जा को रासायनिक ऊर्जा में परिवर्तित करता है।
2. इसकी दर बैंगनी प्रकाश में अधिकतम तथा लाल प्रकाश में न्यूनतम होती है।
3. पर्णहरित प्रकाशग्राही अणु है जो सौर ऊर्जा को अवशोषित करते हैं।
4. इस प्रक्रिया में ऑक्सीकरण और अपचयन अभिक्रियाएँ शामिल होती हैं।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो

(c) केवल तीन *(d)* सभी चार

5. पादप आकारिकी के संदर्भ में झाड़ियों और शाक के मध्य अंतर करने के लिये आमतौर पर निम्नलिखित में से किस विशेषता का उपयोग किया जाता है?

(a) पत्तियों का आकार

(b) पौधे की लंबाई

(c) पुष्पों के प्रकार

(d) मूल की गहराई

6. निम्नलिखित कथनों पर विचार कीजिये:

कथन-I:

जैविक अनुकूलन एक विकासवादी प्रक्रिया है जिसके द्वारा किसी जनसंख्या के लक्षण पीढ़ी दर पीढ़ी उसके पर्यावरण के लिये बेहतर अनुकूलित होते जाते हैं।

कथन-II:

अनुकूलन अल्प समय में नहीं होता क्योंकि किसी क्षेत्र के अजैविक कारक बहुत धीरे-धीरे परिवर्तित होते हैं।

उपर्युक्त कथनों के बारे में, निम्नलिखित में से कौन-सा एक सही है?

(a) कथन-I और कथन-II दोनों सही हैं तथा कथन-II, कथन-I की सही व्याख्या है।

(b) कथन-I और कथन-II दोनों सही हैं तथा कथन-II, कथन-I की सही व्याख्या नहीं है।

(c) कथन-I सही है किंतु कथन-II गलत है।

(d) कथन-I गलत है किंतु कथन-II सही है।

7. मानव शरीर में पेशीय ऊतकों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. शरीर के उन भागों में गैर-धारीदार (अरेखित) पेशियाँ पाई जाती हैं जो स्वैच्छिक गति करते हैं।
2. हृदय का संकुचन एवं विस्तार हृदय की पेशी के कारण होता है।
3. आहार नाल और रक्त वाहिकाएँ रेखित पेशी के उदाहरण हैं।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक

(b) केवल दो

(c) सभी तीन

(d) कोई भी नहीं

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1. Which of the following nutrients is responsible for providing the maximum concentrated source of energy in the human diet?

(a) Vitamins *(b)* Fats
(c) Carbohydrates *(d)* Proteins

2. Which of the following statements accurately describes the behaviour of light when it interacts with translucent materials?

(a) Light is completely absorbed by the material, making it appear opaque.
(b) Light passes through the material with minimal scattering, allowing objects on the other side to be seen clearly.
(c) Light reflects off the surface of the material, creating a mirror-like effect.
(d) Light is partially transmitted through the material, causing it to appear hazy or diffused.

3. Consider the following methods of separation:

1. Threshing
2. Winnowing
3. Evaporation
4. Filtration
5. Sieving

How many of the above can be used for separating a mixture of solid and liquid?

(a) Only two *(b)* Only three
(c) Only four *(d)* All five

4. With reference to photosynthesis, consider the following statements:

1. It converts light energy into chemical energy.
2. Its rate is maximum in violet light and minimum in red light.
3. Chlorophyll is photoreceptor molecule which traps solar energy.
4. The process involves oxidation and reduction reactions.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) Only three *(d)* All four

5. Which of the following characteristics is generally used to distinguish between shrubs and herbs in the context of plant morphology?

(a) Size of leaves
(b) Height of the plant
(c) Type of flowers
(d) Depth of roots

6. Consider the following statements:

Statement-I:
Biological adaptations are an evolutionary process by which a population's traits become better suited to its environment over generations.
Statement-II:
Adaptation does not take place in a short time because the abiotic factor of a region change very slowly.
Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
(b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
(c) Statement-I is correct but Statement-II is incorrect
(d) Statement-I is incorrect but Statement-II is correct

7. With reference to muscular tissue in human body, consider the following statements:

1. Unstriped muscles are found in parts of body that move voluntarily.
2. The contraction and expansion of heart is due to cardiac muscle.
3. Alimentary canal and blood vessels are examples of striped muscle.

How many of the above statements are correct?

(a) Only one
(b) Only two
(c) All three
(d) None

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8. एकसमान वृत्तीय गति के संदर्भ में, निम्नलिखित में से कौन-सा कथन सही है?

(a) वस्तु की चाल स्थिर रहती है जबकि दिशा निरंतर परिवर्तित होती है।

(b) वस्तु की चाल निरंतर परिवर्तित होती है, जबकि दिशा स्थिर रहती है।

(c) वस्तु की चाल और दिशा दोनों स्थिर रहती हैं।

(d) न तो वस्तु की चाल और न ही दिशा परिवर्तित होती है।

9. निम्नलिखित कथनों पर विचार कीजिये:

कथन-I:

छाया इसलिये निर्मित होती है क्योंकि किसी वस्तु द्वारा प्रकाश को अवरुद्ध अथवा बाधित कर दिया जाता है, जिससे वह कुछ क्षेत्रों तक नहीं पहुँच पाता है।

कथन-II:

वस्तु से गुजरते समय प्रकाश के बंकन से छाया उत्पन्न होती है।

उपर्युक्त कथनों के बारे में, निम्नलिखित में से कौन-सा एक सही है?

(a) कथन-I और कथन-II दोनों सही हैं तथा कथन-II, कथन-I की सही व्याख्या है।

(b) कथन-I और कथन-II दोनों सही हैं तथा कथन-II, कथन-I की सही व्याख्या नहीं है।

(c) कथन-I सही है किंतु कथन-II गलत है।

(d) कथन-I गलत है किंतु कथन-II सही है।

10. चुंबकत्व के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. एक स्वतंत्र रूप से निलंबित चुंबक हमेशा उत्तर-दक्षिण दिशा में संरेखित होता है।
2. दो चुंबकों के विपरीत ध्रुव एक दूसरे को आकर्षित करते हैं जबकि समान ध्रुव एक दूसरे को प्रतिकर्षित करते हैं।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1

(b) केवल 2

(c) 1 और 2 दोनों

(d) न तो 1 और न ही 2

11. निम्नलिखित कथनों पर विचार कीजिये:

1. वाष्पीकरण और वाष्पोत्सर्जन द्वारा जलवाष्प वायु में मिल जाती है।
2. जलीय जंतु श्वसन के लिये जल में विलयित वायु का उपयोग करते हैं।

उपर्युक्त कथनों में से कौन-सा/से सही ***नहीं*** है/हैं?

(a) केवल 1

(b) केवल 2

(c) 1 और 2 दोनों

(d) न तो 1 और न ही 2

12. निम्नलिखित युग्मों पर विचार कीजिये:

उपकरण		*उपयोग*
1. वोल्टमीटर	:	विद्युत विभवान्तर का मापन
2. एमीटर	:	धारा की दिशा का मापन
3. गैल्वेनोमीटर	:	विद्युत धारा के परिमाण का मापन

उपर्युक्त में से कितने युग्म सही सुमेलित हैं?

(a) केवल एक

(b) केवल दो

(c) सभी तीन

(d) कोई भी नहीं

13. जीवाणु के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. जीवाणु अपने पोषण की विधि में स्वपोषी या परपोषी हो सकते हैं।
2. ये सर्वाधिक संख्या में पाए जाने वाले सूक्ष्मजीव हैं।
3. विषाणु के विपरीत, ये विषम एवं प्रतिकूल वातावरण में जीवित रहने में असमर्थ हैं।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो

(c) सभी तीन *(d)* कोई भी नहीं

14. निम्नलिखित में से किस तत्त्व का प्रतिशत मानव शरीर में सर्वाधिक है?

(a) हाइड्रोजन

(b) कार्बन

(c) ऑक्सीजन

(d) नाइट्रोजन

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8. In the context of uniform circular motion, which of the following statements is correct?

(a) The speed of the object remains constant, while the direction changes continuously.

(b) The speed of the object changes continuously, while the direction remains constant.

(c) Both the speed and direction of the object remain constant.

(d) Neither the speed nor the direction of the object changes.

9. Consider the following statements:

Statement-I:

Shadow is formed because light is blocked or obstructed by the object, preventing it from reaching certain areas.

Statement-ll:

Shadows result from the bending of light as it passes through the object.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I

(b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I

(c) Statement-I is correct but Statement-II is incorrect

(d) Statement-I is incorrect but Statement-II is correct

10. With reference to magnetism, consider the following statements:

1. A freely suspended magnet always aligns in North-South direction.
2. Opposite poles of two magnets attract each other whereas similar poles repel one another.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

11. Consider the following statements:

1. Water vapour gets added to air by evaporation and transpiration.
2. Aquatic animals use dissolved air in water for respiration.

Which of the statements given above is/are ***not*** correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

12. Consider the following pairs:

	Device		*Use*
1.	Voltmeter	:	Measurement of electric potential difference
2.	Ammeter	:	Measurement of direction of current
3.	Galvanometer	:	Measurement of magnitude of current

How many of the above pairs are correctly matched?

(a) Only one

(b) Only two

(c) All three

(d) None

13. With reference to Bacteria, consider the following:

1. Bacteria may be autotrophic or heterotrophic in their mode of nutrition.
2. They are the most abundant micro-organisms.
3. Unlike virus, they are incapable of surviving in extreme environments.

How many of the above statements are correct?

(a) Only one *(b)* Only two

(c) All three *(d)* None

14. Which of the following elements constitute the maximum percentage in the human body?

(a) Hydrogen

(b) Carbon

(c) Oxygen

(d) Nitrogen

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15. निम्नलिखित पर विचार कीजिये:

1. प्रद्रव्य (प्लाज़्मा) रक्त का प्रमुख घटक है।
2. रक्त समूह का निर्धारण प्रतिजन और प्रतिरक्षी की उपस्थिति से होता है।
3. रक्त स्कंदन में पट्टीकाणु (प्लेटलेट्स) महत्त्वपूर्ण भूमिका निभाते हैं।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक
(b) केवल दो
(c) सभी तीन
(d) कोई भी नहीं

16. मधुमेह के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. टाइप 1 मधुमेह मुख्य रूप से जीवनशैली कारकों जैसे अनुचित आहार और शारीरिक गतिविधि की कमी के कारण होता है।
2. टाइप 2 मधुमेह एक स्वप्रतिरक्षित प्रतिक्रिया के परिणामस्वरूप होता है जो अग्न्याशय में इंसुलिन-उत्पादक कोशिकाओं को नष्ट कर देता है।
3. इंसुलिन एक हार्मोन है जो रक्त शर्करा के स्तर को नियंत्रित करने में मदद करता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 और 2 *(b)* केवल 3
(c) केवल 2 और 3 *(d)* 1, 2 और 3

17. निम्नलिखित पर विचार कीजिये:

1. कागज कारखानों में विरंजक कारक के रूप में।
2. लांड्री में कपड़े धोने के लिये विरंजक कारक के रूप में।
3. कई रासायनिक उद्योगों में उपचायक के रूप में।
4. पीने के जल को रोगाणुओं से मुक्त बनाने के लिये।

विरंजक चूर्ण के उपयोग के संदर्भ में उपर्युक्त में से कितने सही हैं?

(a) केवल एक
(b) केवल दो
(c) केवल तीन
(d) सभी चार

18. निम्नलिखित पर विचार कीजिये:

1. पारा को छोड़कर सभी धातुएँ कमरे के तापमान पर ठोस अवस्था में विद्यमान रहती हैं।
2. कार्बन एक अधातु है जो विभिन्न रूपों में विद्यमान रहती है।
3. क्षारीय धातुएँ इतनी नरम होती हैं कि इन्हें चाकू से काटा जा सकता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

19. निम्नलिखित पर विचार कीजिये:

1. स्वर्ण, चांदी, प्लैटिनम और तांबा प्रकृति में कभी भी मुक्त तत्त्वों के रूप में नहीं पाए जाते हैं।
2. मैग्नीशियम, पोटैशियम और एल्युमिनियम प्रकृति में मुक्त अवस्था में पाए जाते हैं।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1
(b) केवल 2
(c) 1 और 2 दोनों
(d) न तो 1 और न ही 2

20. लघुपथन के समय परिपथ में विद्युत धारा का मान

(a) अत्यधिक बढ़ जाता है
(b) तेज़ी से कम हो जाता है
(c) अपरिवर्तित रहता है
(d) लगातार परिवर्तित होता रहता है

21. निम्नलिखित पर विचार कीजिये:

1. मृगतृष्णा
2. प्रकाशीय तंतु संचार
3. प्रकाश का जल से काँच की ओर संचरण
4. प्रकाश का प्रकीर्णन

उपर्युक्त अनुप्रयोगों/परिघटनाओं में से कितने पूर्ण आंतरिक परावर्तन को सम्मिलित करते हैं?

(a) केवल एक
(b) केवल दो
(c) केवल तीन
(d) सभी चार

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15. Consider the following:

1. Plasma forms the major component of blood.
2. Blood groups are determined by presence of antigens and antibodies.
3. Platelets play a crucial role in coagulation of blood.

How many of the above statements are correct?

(a) Only one
(b) Only two
(c) All three
(d) None

16. With reference to Diabetes, consider the following statements:

1. Type 1 diabetes is primarily caused by lifestyle factors such as poor diet and lack of physical activity.
2. Type 2 diabetes results from an autoimmune response that destroys insulin-producing cells in the pancreas.
3. Insulin is a hormone that helps regulate blood sugar levels.

Which of the statements given above is/are correct?

(a) 1 and 2 only *(b)* 3 only
(c) 2 and 3 only *(d)* 1, 2 and 3

17. Consider the following:

1. As a bleaching agent in paper factories.
2. As a bleaching agent for washing clothes in laundry.
3. As an oxidising agent in many chemical industries.
4. For making drinking water free from germs.

How many of the above are correct with reference to the usage of Bleaching Powder?

(a) Only one
(b) Only two
(c) Only three
(d) All four

18. Consider the following:

1. All metals except mercury exist as solids at room temperature.
2. Carbon is a non-metal that can exist in different forms.
3. Alkali metals are so soft that they can be cut with a knife.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

19. Consider the following:

1. Gold, Silver, Platinum and Copper are never found in nature as free elements.
2. Magnesium, Potassium and Aluminium are found in the free state in the nature.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

20. When there is a short circuit, the current in the circuit

(a) increases heavily
(b) decreases drastically
(c) does not change at all
(d) varies continuously

21. Consider the following:

1. Mirage
2. Fiber optics communication
3. Light travelling from water to glass
4. Dispersion of light

How many of the above applications/phenomenon are covered by total internal reflection?

(a) Only one
(b) Only two
(c) Only three
(d) All four

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22. पादप कोशिका और जंतु कोशिका के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. पादप और जंतु दोनों कोशिकाओं में एक केंद्रक होता है।
2. पादप कोशिकाओं में कोशिका भित्ति पाई जाती है, किंतु जंतु कोशिकाओं में कोशिका भित्ति का अभाव होता है।
3. ऊर्जा उत्पादन के लिये ज़िम्मेदार कोशिकांग पादप और जंतु दोनों कोशिकाओं में मौजूद होते हैं।
4. जंतु कोशिकाओं में रसधानी आमतौर पर पादप कोशिकाओं की तुलना में बड़ी और अधिक प्रमुख होती हैं।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक
(b) केवल दो
(c) केवल तीन
(d) सभी चार

23. मानव नेत्र के बारे में निम्नलिखित कथनों पर विचार कीजिये:

1. स्वच्छ मंडल (कार्निया) नेत्र का वह भाग है जो रंग दृष्टि के लिये ज़िम्मेदार होता है।
2. पुतली का आकार स्थिर रहता है और अलग-अलग प्रकाश स्थितियों की प्रतिक्रिया में नहीं बदलता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

24. निम्नलिखित पर विचार कीजिये:

1. चुंबकीय क्षेत्र रेखाएँ चुंबक के दक्षिणी ध्रुव से निकलकर उत्तरी ध्रुव की ओर एकत्रित होती हैं।
2. चुंबकीय क्षेत्र रेखाएँ हमेशा बंद पथ बनाती हैं, जिनका कोई आरंभ या अंत नहीं होता।
3. पृथ्वी का चुंबकीय क्षेत्र मुख्य रूप से इसके अंत:क्रोड में विगलित लौह की गति से उत्पन्न होता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक
(b) केवल दो
(c) सभी तीन
(d) कोई भी नहीं

25. निम्न पर विचार कीजिये:

1. पश्च दृश्य दर्पण 2. आवर्द्धक लेंस
3. प्रिज़्म 4. मायोपिक लेंस

उपर्युक्त में से कितने प्रकाशीय उपकरण उत्तल लेंस/दर्पण का उपयोग करते हैं?

(a) केवल एक *(b)* केवल दो
(c) केवल तीन *(d)* सभी चार

26. निम्नलिखित कथनों पर विचार कीजिये:

1. स्थलीय पारिस्थितिकी तंत्र में हरे पादप भोजन निर्माण के लिये सूर्य के प्रकाश की लगभग 30% ऊर्जा ग्रहण करते हैं।
2. प्रत्येक पोषण स्तर पर ऊर्जा में अत्यधिक वृद्धि होती है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

27. निम्नलिखित में से कौन-सा बल एक अणु में सभी परमाणुओं को एक साथ बाँधे रखने के लिये ज़िम्मेदार है?

(a) विद्युतचुंबकीय बल
(b) गुरुत्वाकर्षण बल
(c) दुर्बल परमाणु बल
(d) प्रबल परमाणु बल

28. e-NAM के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह एक अखिल भारतीय इलेक्ट्रॉनिक ट्रेडिंग पोर्टल है जो मौजूदा कृषि उपज बाज़ार समिति मंडियों को एकीकृत करता है।
2. यह पूर्णत: केंद्र सरकार द्वारा वित्त पोषित है।
3. इसे कृषि एवं किसान कल्याण मंत्रालय के तहत लघु कृषक कृषि व्यवसाय संघ द्वारा कार्यान्वित किया जाता है।
4. यह संपर्क रहित दूरस्थ नीलामी-प्रक्रिया एवं किसी भी समय मोबाइल-आधारित भुगतान की सुविधा प्रदान करता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल 1, 2 और 3 *(b)* केवल 1, 2 और 4
(c) केवल 3 और 4 *(d)* 1, 2, 3 और 4

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22. With reference to Plant cell and Animal cell, consider the following statements:

1. Both plant and animal cells have a nucleus.
2. Plant cells have a cell wall, while animal cells lack a cell wall.
3. The organelles responsible for energy production, are present in both plant and animal cells.
4. Vacuoles in animal cells are typically larger and more prominent than those in plant cells.

How many of the above statements are correct?

(a) Only one
(b) Only two
(c) Only three
(d) All four

23. Consider the following statements about the human eye:

1. The cornea is the part of the eye responsible for colour vision.
2. The pupil size remains constant and does not change in response to varying light conditions.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

24. Consider the following:

1. Magnetic field lines emerge from the south pole and converge towards the north pole of a magnet.
2. Magnetic field lines always form closed loops, with no beginning or end.
3. The Earth's magnetic field is primarily generated by the movement of molten iron in its core.

How many of the above statements are correct?

(a) Only one
(b) Only two
(c) All three
(d) None

25. Consider the following:

1. Rear-view mirror 2. Magnifying glass
3. Prism 4. Myopic lens

How many of the above optical devices uses a convex lens/mirror?

(a) Only one *(b)* Only two
(c) Only three *(d)* All four

26. Consider the following statements:

1. The green plants in a terrestrial ecosystem capture about 30% of the energy of sunlight to make food.
2. The energy at each trophic level increases substantially.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

27. Which of the following forces is responsible for holding all the atoms together in a molecule?

(a) Electromagnetic force
(b) Gravitational force
(c) Weak nuclear force
(d) Strong nuclear force

28. With reference to e-NAM, consider the following statements:

1. It is a pan-India electronic trading portal that networks the existing Agricultural Produce Market Committee mandis.
2. It is completely funded by the Central Government.
3. It is implemented by the Small Farmers Agribusiness Consortium, under the Ministry of Agriculture and Farmers' Welfare.
4. It provides contactless remote bidding and mobile-based anytime payment.

Which of the statements given above are correct?

(a) 1, 2 and 3 only *(b)* 1, 2 and 4 only
(c) 3 and 4 only *(d)* 1, 2, 3 and 4

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29. PM-किसान मोबाइल ऐप के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसे कृषि एवं किसान कल्याण मंत्रालय (MoA-FW) द्वारा चेहरा प्रमाणीकरण विशेषता के साथ विमोचित किया गया है।
2. यह किसानों को OTP अथवा अंगुलिछापी का उपयोग करने के बजाय मोबाइल फोन पर अपना चेहरा स्कैन करके अपनी e-KYC प्रक्रिया पूरी करने में सक्षम बनाएगा।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

30. निम्नलिखित पर विचार कीजिये:

1. स्मार्ट बोर्ड
2. ऑनलाइन परीक्षण
3. कक्षाओं के दरवाज़ों पर वाई-फाई सेंसर
4. अवस्थिति की निगरानी के लिये बसों में सेंसर
5. उपस्थिति की निगरानी के लिये पहनने योग्य उपकरण (घड़ियाँ अथवा स्मार्ट बेल्ट)।

उपर्युक्त में से कौन-से इंटरनेट ऑफ थिंग्स (IoT) सक्षम स्मार्ट स्कूल में उपलब्ध हो सकता है?

(a) केवल दो *(b)* केवल तीन
(c) केवल चार *(d)* सभी पाँच

31. ध्रुवीय ज्योति (ऑरोरा) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. ये भू-चुंबकीय तूफान हैं जो सूर्य की प्लाज़्मा तरंगों तथा पृथ्वी के चुंबकीय क्षेत्र की तीव्र अंत:क्रिया के कारण देखे जाते हैं।
2. उत्तरी और दक्षिणी चुंबकीय ध्रुवों के ऊपर, पृथ्वी का चुंबकीय क्षेत्र दो ध्रुवीय अंडाकारों का रूप लेता है।
3. वे पृथ्वी के ध्रुवों के निकट, उच्च अक्षांशों पर अधिक पाए जाते हैं।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

32. निम्नलिखित कथनों पर विचार कीजिये:

1. के. केलप्पन वायकोम सत्याग्रह आंदोलन के अग्रदूतों में से एक थे।
2. इन्होंने पहली बार त्रावणकोर में विरोध के गांधीवादी तरीकों का प्रयोग किया।
3. यह अधिक करों के विरुद्ध किसानों का विद्रोह था।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल 1 और 2 *(b)* केवल 2 और 3
(c) केवल 1 और 3 *(d)* 1, 2 और 3

33. भारत के धरोहर स्थलों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. भारत में केवल दो मिश्रित प्रकार के यूनेस्को विश्व धरोहर स्थल हैं।
2. भारतीय संविधान का अनुच्छेद 49 ऐतिहासिक स्थलों की सुरक्षा का प्रावधान करता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

34. संयुक्त राष्ट्र जनसंख्या कोष (UNFPA) के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. यह विश्व जनसंख्या स्थिति रिपोर्ट जारी करता है।
2. यह संयुक्त राष्ट्र के बजट से वित्तपोषित है।
3. यह संयुक्त राष्ट्र महासभा का एक सहायक अंग है।
4. यह यौन तथा प्रजनन स्वास्थ्य हेतु संयुक्त राष्ट्र की एक संस्था है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल 1 और 3 *(b)* केवल 2 और 4
(c) केवल 1, 2 और 4 *(d)* केवल 1, 3 और 4

35. निम्नलिखित कथनों पर विचार कीजिये:

1. अर्थ आवर, विश्व वन्यजीव कोष (WWF) द्वारा आयोजित एक विश्वव्यापी आंदोलन है।
2. अर्थ ओवरशूट डे की अवधारणा संयुक्त राष्ट्र पर्यावरण कार्यक्रम (UNEP) द्वारा विकसित की गई थी।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

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29. With reference to PM-Kisan Mobile App, consider the following statements:

1. It is launched by the Ministry of Agriculture & Farmers Welfare (MoA&FW) with face authentication feature.
2. It will enable farmers to complete their e-KYC process by scanning their face on mobile phones instead of using OTPs or fingerprints.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

30. Consider the following:

1. Smart boards
2. Online tests
3. Wifi sensors on classrooms doors
4. Sensors in buses for monitoring location
5. Wearables (watches or smart belts) for attendance monitoring

Which of the above can be available in the Internet of Things (IoT) enabled smart school?

(a) Only two *(b)* Only three
(c) Only four *(d)* All five

31. With reference to Auroras, consider the following statements:

1. They are geomagnetic storms seen due to an intense interaction of the sun's plasma waves and the earth's magnetic field.
2. The shape of Earth's magnetic field creates two auroral ovals above the North and South Magnetic Poles.
3. They are more frequent at higher latitudes, closer to the Earth's poles.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

32. Consider the following statements:

1. K. Kelappan was one of the pioneers of the Vaikom Satyagraha movement.
2. It brought Gandhian methods of protest to Travancore for the first time.
3. It was the farmer's uprising against the high taxes.

Which of the statements given above are correct?

(a) 1 and 2 only *(b)* 2 and 3 only
(c) 1 and 3 only *(d)* 1, 2 and 3

33. With reference to heritage sites in India, consider the following statements:

1. There are only two mixed type UNESCO world heritage sites in India.
2. Article 49 of the Indian constitution provides for the protection of historical sites.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

34. With reference to United Nations Population Fund (UNFPA), consider the following statements:

1. It releases the State of World Population report.
2. It is supported by the UN budget.
3. It is a subsidiary organ of the UN General Assembly.
4. It is United Nations sexual and reproductive health agency.

Which of the statements given above are correct?

(a) 1 and 3 only *(b)* 2 and 4 only
(c) 1, 2 and 4 only *(d)* 1, 3 and 4 only

35. Consider the following statements:

1. Earth Hour is a worldwide movement organised by World Wildlife Fund (WWF).
2. The concept of Earth Overshoot Day was developed by United Nations Environment Programme (UNEP).

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

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36. निम्नलिखित युग्मों पर विचार कीजिये:

द्वीप समूह		*महासागर*
1. कोको द्वीप समूह	:	हिंद महासागर
2. सेनकाकू द्वीप समूह	:	अटलांटिक महासागर
3. रीयूनियन द्वीप समूह	:	प्रशांत महासागर

उपर्युक्त में से कितने युग्म सही सुमेलित हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

37. निम्नलिखित युग्मों पर विचार कीजिये:

शर्करा		*स्रोत*
1. लैक्टोस	:	दुग्ध और डेयरी उत्पाद
2. सूक्रोस	:	फल, चुकंदर और सब्ज़ियाँ
3. माल्टोस	:	रोटी और अनाज

उपर्युक्त में से कितने युग्म सही सुमेलित हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

38. विटामिन के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. विटामिन B12 जल में घुलनशील होता है जिसके कारण यह हमारे शरीर में संग्रहित नहीं होता है।
2. पराबैंगनी B (UVB) विकिरण के संपर्क में आने पर विटामिन D3 सीधे त्वचा में संश्लेषित होता है।
3. सभी विटामिन ऐमीनो समूह के कार्बनिक यौगिक हैं।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

39. DNA अंगुलिछापी (DNA फिंगर प्रिंटिंग) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये :

1. प्रत्येक व्यक्ति की अंगुलियों के छाप अलग-अलग होते हैं।
2. इन्हें सर्जरी द्वारा बदला जा सकता है।
3. दो व्यक्तियों के DNA का अनुक्रम समान हो सकता है।
4. यह हर कोशिका के लिये अलग है और इसे बदला जा सकता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) केवल तीन *(d)* सभी चार

40. निम्नलिखित कथनों पर विचार कीजिये:

कथन-I:

DNA कोशिकीय जानकारी के भंडार के रूप में कार्य करता है।

कथन-II:

कोशिकाओं में दीर्घकालिक आनुवंशिक जानकारी के लिये RNA का उपयोग नहीं किया जाता है।

उपर्युक्त कथनों के बारे में निम्नलिखित में से कौन-सा सही है?

(a) कथन-I और कथन-II दोनों सही हैं तथा कथन-II, कथन-I की सही व्याख्या है।
(b) कथन-I और कथन-II दोनों सही हैं तथा कथन-II, कथन-I की सही व्याख्या नहीं है।
(c) कथन-I सही है किंतु कथन-II गलत है।
(d) कथन-I गलत है किंतु कथन-II सही है।

41. बहुलक के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. सभी बहुलक अजैव-निम्नीकरणीय हैं।
2. आइसोप्रीन एक संश्लेषित बहुलक है।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1
(b) केवल 2
(c) 1 और 2 दोनों
(d) न तो 1 और न ही 2

42. निम्नलिखित युग्मों पर विचार कीजिये:

औषधि		*अनुप्रयोग*
1. हिस्टैमिन	:	प्रतिअम्ल
2. इप्रोनियाज़िड	:	प्रतिजैविक
3. एस्पिरिन	:	पीड़ाहारी
4. पेनिसिलिन	:	प्रतिअवसादक

उपर्युक्त में से कितने युग्म सही सुमेलित हैं?

(a) केवल एक
(b) केवल दो
(c) केवल तीन
(d) सभी चार

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36. Consider the following pairs:

Islands		*Ocean*
1. Coco Islands	:	Indian Ocean
2. Senkaku Islands	:	Atlantic Ocean
3. Reunion Islands	:	Pacific Ocean

How many of the above pairs are correctly matched?

(a) Only one *(b)* Only two
(c) All three *(d)* None

37. Consider the following pairs:

Sugar		*Source*
1. Lactose	:	milk and dairy products
2. Sucrose	:	fruits, suger beet and vegetables
3. Maltose	:	breads and cereals

How many of the above pairs are correctly matched?

(a) Only one *(b)* Only two
(c) All three *(d)* None

38. Consider the following statements with reference to Vitamins:

1. Vitamin B12 is water soluble due to which it is not stored in our body.
2. Vitamin D3 is directly synthesized in the skin when it is exposed to ultraviolet B (UVB) radiation.
3. All vitamins are organic compounds of amino groups.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

39. Consider the following statements with reference to DNA fingerprinting:

1. Every individual has unique fingerprints.
2. These can be altered by surgery.
3. A sequence of DNA can be the same for two persons.
4. It is different for every cell and can be altered.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) Only three *(d)* All four

40. Consider the following statements:

Statement-I:
DNA serves as the complete library of cellular information.
Statement-II:
RNA is not used for long-term genetic information in cells.
Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
(b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
(c) Statement-I is correct but Statement-II is incorrect
(d) Statement-I is incorrect but Statement-II is correct

41. Consider the following statements with reference to polymers:

1. All the polymers are non-biodegradable.
2. Isoprene is a synthetic polymer.

Which of the above statements is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

42. Consider the following pairs:

Medicine		*Used as*
1. Histamine	:	antacid
2. Iproniazid	:	antibiotic
3. Aspirin	:	analgesic
4. Penicillin	:	antidepressant

How many of the above pairs are correctly matched?

(a) Only one
(b) Only two
(c) Only three
(d) All Four

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43. कृत्रिम मधुरक के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. सैकरिन गन्ने के शर्करा से लगभग 550 गुना अधिक मीठा होता है।
2. ऐस्पार्टेम का उपयोग ठंडे खाद्य पदार्थों और शीतल पेय पदार्थों में किया जाता है।
3. कृत्रिम शर्करा उच्च कैलोरी सेवन बढ़ाती है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

44. निम्नलिखित कथनों पर विचार कीजिये:

1. संश्लेषित अपमार्जक दीर्घ शृंखला वाले वसा अम्ल के सोडियम या पोटैशियम लवण होते हैं।
2. साबुन सल्फोनेटेड दीर्घ शृंखला वाले एल्कोहॉल या हाइड्रोकार्बन के सोडियम या अमोनियम लवण हैं।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

45. 'यातायात और भीड़भाड़ वाले स्थानों में परेशान करने वाली लाल धुंध इसी गैस के कारण है। गैस की उच्च सांद्रता पौधों की पत्तियों को नुकसान पहुँचाती है और प्रकाश संश्लेषण की दर को धीमा कर देती है। यह फुफ्फुस (फेफड़ों) में जलन पैदा करने वाला एक पदार्थ है जो बच्चों में तीव्र श्वसन रोगों का कारण बन सकता है। यह जीवित ऊतकों के लिये भी विषाक्त होता है। यह विभिन्न वस्त्र रेशों और धातुओं के लिये भी हानिकारक है।'

निम्नलिखित में से किस प्रदूषक गैस के प्रभाव का वर्णन ऊपर किया गया है?

(a) नाइट्रोजन गैस *(b)* कार्बन मोनोआक्साइड
(c) सल्फर डाइऑक्साइड *(d)* नाइट्रोजन डाइऑक्साइड

46. निम्नलिखित पर विचार कीजिये:

1. धान के खेत
2. पराली दहन
3. कोयले की खान
4. जीवाश्म ईंधन
5. दीमक

उपर्युक्त में से कितने मीथेन उत्सर्जन में योगदान करते हैं?

(a) केवल दो *(b)* केवल तीन
(c) केवल चार *(d)* सभी पाँच

47. प्रकाश रासायनिक धूम्र कोहरे के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. प्रकाश रासायनिक धूम्र कोहरा शीत नम जलवायु में उत्पन्न होता है।
2. प्रकाश रासायनिक धूम्र कोहरे के सामान्य घटक ओज़ोन, नाइट्रिक ऑक्साइड एवं परॉक्सीऐसीटिल नाइट्रेट (PAN) हैं।
3. पाईनस, जुनीपेरस, क्वेरकस, पायरस तथा विटिस नाइट्रोजन ऑक्साइड का उपापचय कर सकते हैं और इसलिये उनका रोपण प्रकाश रासायनिक धूम्र कोहरे के मुद्दे को संबोधित करने में मदद कर सकता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

48. मानहानि प्रावधान के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. भारतीय दंड संहिता (IPC) की धारा 499 इस संदर्भ की व्याख्या करती है कि कैसे मानहानि बोले गए या पढ़े जाने वाले शब्दों के माध्यम से, या संकेतों के माध्यम से या दृश्य प्रतिनिधित्व के माध्यम से हो सकती है।
2. मानहानि, अनुच्छेद 19 के अंतर्गत वाक् एवं अभिव्यक्ति की स्वतंत्रता पर उचित प्रतिबंध लगाने का आधार है।
3. मानहानि नागरिक अपकृत्य है न कि कोई दंडनीय अपराध।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

49. निम्नलिखित में से किस शहरी स्थानीय निकाय में शहरी क्षेत्रों के प्रशासन के लिये नामांकित सदस्य हो सकते हैं?

1. अधिसूचित क्षेत्र समिति
2. छावनी बोर्ड
3. पत्तन न्यास
4. टाउनशिप

नीचे दिये गए कूट का उपयोग करके सही उत्तर चुनिये:

(a) केवल 1 और 2 *(b)* केवल 2 और 4
(c) केवल 1 और 3 *(d)* 1, 2, 3 और 4

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43. Consider the following statements with reference to artificial sugar:

1. Saccharin is about 550 times as sweet as cane sugar.
2. Aspartame is used in cold foods and soft drinks.
3. Artificial sugar adds to high calorie intake.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

44. Consider the following statements:

1. Synthetic detergents are sodium or potassium salts of long chain fatty acids.
2. Soaps are sodium or ammonium salts of sulphonated long chain alcohols or hydrocarbons.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

45. 'The irritant red haze in the traffic and congested places is due to this gas. Higher concentrations of the gas damage the leaves of plants and retard the rate of photosynthesis. It is a lung irritant that can lead to acute respiratory diseases in children. It is toxic to living tissues also. It is also harmful to various textile fibres and metals.'
Effects of which of the following gas is described above?

(a) Nitrogen gas *(b)* Carbon monoxide
(c) Sulphur dioxide *(d)* Nitrogen dioxide

46. Consider the following:

1. Paddy fields
2. Stubble burning
3. Coal Mines
4. Fossil fuels
5. Termites

How many of the above contribute to the methane emissions?

(a) Only two *(b)* Only three
(c) Only four *(d)* All five

47. Consider the following statements with reference to Photochemical Smog?

1. Photochemical smog occurs in cool humid climates.
2. The common components of photochemical smog are ozone, nitric oxide and peroxyacetyl nitrate (PAN).
3. Pinus, Juniparus, Quercus, Pyrus and Vitis can metabolise nitrogen oxide and therefore, their plantation could help in addressing the issue of Photochemical smog.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

48. With reference to defamation provision, consider the following statements:

1. Section 499 of the Indian Penal Code (IPC) elaborates on how defamation could be through words either spoken or intended to be read, or by signs, or by visible representations.
2. Defamation is a ground of imposing reasonable restrictions on the freedom of speech and expression under Article 19.
3. Defamation is a civil wrong and not a criminal offense.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

49. Which among the following urban local bodies can have nominated members for the administration of urban areas?

1. Notified Area Committee
2. Cantonment Board
3. Port Trust
4. Township

Select the correct answer using the code given below:

(a) 1 and 2 only *(b)* 2 and 4 only
(c) 1 and 3 only *(d)* 1, 2, 3 and 4

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50. दीनदयाल अंत्योदय योजना-राष्ट्रीय ग्रामीण आजीविका मिशन के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. यह एक केंद्रीय क्षेत्र की योजना है, जो ग्रामीण विकास मंत्रालय द्वारा आरंभ की गई है।
2. इसमें स्वयं सहायता की भावना से सामुदायिक पेशेवरों के माध्यम से सामुदायिक संस्थानों के साथ कार्य करना शामिल है।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

51. अनुच्छेद 22 के अंतर्गत निवारक निरोध के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. निवारक हिरासत से सुरक्षा केवल नागरिकों को उपलब्ध है, विदेशियों को नहीं।
2. निवारक निरोध विधि के अंतर्गत किसी व्यक्ति की हिरासत किसी भी परिस्थिति में 3 माह से अधिक नहीं हो सकती है।
3. राज्य विधायिका के पास अधिकतम अवधि निर्धारित करने का अधिकार है जिसके लिये किसी व्यक्ति को निवारक निरोध विधि के अंतर्गत हिरासत में रखा जा सकता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

52. राष्ट्रीय दल के रूप में मान्यता के संबंध में निम्नलिखित कथनों पर विचार कीजिये:

1. जिस दल को कम-से-कम चार राज्यों में राज्यीय दल के रूप में मान्यता प्राप्त हो वह राष्ट्रीय दल का दर्ज़ा प्राप्त करने के लिये पात्र है।
2. राष्ट्रीय दल के रूप में मान्यता प्रदान करने के लिये लगातार दो लोकसभा या विधानसभा चुनावों में दल के प्रदर्शन पर विचार किया जाता है।

उपर्युक्त में से कौन-सा/से कथन सही ***नहीं*** है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

53. हाल ही में जन समाचारों में देखा गया न्यायमूर्ति रंगनाथ मिश्रा आयोग संबंधित है

(a) उभयलिंगी व्यक्तियों की सामाजिक-आर्थिक एवं शैक्षिक स्थिति की जाँच से
(b) धार्मिक एवं भाषायी अल्पसंख्यकों की स्थितियों के आकलन से
(c) सरकारी संस्थानों में भ्रष्टाचार की जाँच से
(d) औद्योगीकरण के पर्यावरणीय प्रभाव के विश्लेषण से

54. हाल के वर्षों में यमन, सीरिया और लीबिया ने निम्नलिखित में से किस कारण से अंतर्राष्ट्रीय ध्यान आकर्षित किया है?

(a) इस्लामी गणतंत्र का पुनरुत्थान
(b) चीनी सैन्य अड्डों की स्थापना
(c) गृहयुद्ध
(d) सफल तख्तापलट

55. निम्नलिखित देशों पर विचार कीजिये:

1. इराक 2. तुर्किये
3. आर्मेनिया 4. अज़रबैजान
5. तुर्कमेनिस्तान 6. सऊदी अरब

उपर्युक्त में से कितने देश ईरान के साथ स्थल सीमा साझा करते हैं?

(a) केवल तीन
(b) केवल चार
(c) केवल पाँच
(d) सभी छह

56. उत्तर अटलांटिक संधि संगठन (NATO) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह एक सैन्य गठबंधन है जिसका उद्देश्य अपने सदस्य राष्ट्रों के बीच पारस्परिक रक्षा और सामूहिक सुरक्षा को बढ़ावा देना है।
2. यह इस सिद्धांत पर कार्य करता है कि किसी एक सदस्य राष्ट्र पर हमला सभी सदस्यों पर हमला माना जाएगा।
3. नाटो की सुरक्षा सदस्य राष्ट्रों के गृहयुद्ध या आंतरिक तख्तापलट तक विस्तृत है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

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50. With reference to Deendayal Antyodaya Yojana-National Rural Livelihood Mission consider the following statements:

1. It is a Central sector scheme, launched by the Ministry of Rural Development.
2. It involves working with community institutions through community professionals in the spirit of self-help.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

51. Consider the following statements with reference to preventive detention under Article 22:

1. The protection against preventive detention is available only to citizens and not to aliens.
2. The detention of a person under preventive detention law cannot exceed 3 months under any circumstances.
3. The state legislature has the authority to prescribe the maximum period for which a person can be detained under preventive detention.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

52. Consider the following statement regarding recognition as national party:

1. A party which has got recognition as a state party in at least four states is eligible for National Party Status.
2. For granting recognition as a national party, the party's performance over two consecutive Lok Sabha or assembly elections is considered.

Which of the statements given above is/are ***not*** correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

53. Justice Ranganath Mishra Commission recently seen in news, is associated with

(a) Examining the socio-economic and educational status of transgenders
(b) Assessing the conditions of religious and linguistic minorities
(c) Investigating corruption in government institutions
(d) Analysing the environmental impact of industrialization

54. In the recent years Yemen, Syria and Libya caught the international attention for which one of the following reasons common to all of them?

(a) Resurgence of Islamic republic
(b) Establishment of Chinese military bases
(c) Civil war
(d) Successful coups

55. Consider the following countries:

1. Iraq 2. Türkiye
3. Armenia 4. Azerbaijan
5. Turkmenistan 6. Saudi Arabia

How many of the above-mentioned countries share a land border with Iran?

(a) Only three
(b) Only four
(c) Only five
(d) All six

56. With reference to North Atlantic Treaty Organization (NATO), consider the following statements:

1. It is a military alliance that aims to promote mutual defence and collective security among its members.
2. It operates on the principle that an attack on one member is an attack on all members.
3. NATO's protection also extends to members' civil wars or internal coups.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

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57. हाल ही में आयोजित प्रथम जल निकाय गणना के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसका संचालन पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय द्वारा किया गया था।
2. देश में जल निकायों की सबसे अधिक संख्या उत्तर प्रदेश में है।
3. कुल जल निकायों का लगभग 40% शहरी क्षेत्रों में स्थित है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

58. हीटवेव के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यदि किसी स्थान का अधिकतम तापमान मैदानी क्षेत्रों में कम-से-कम 40 डिग्री सेल्सियस एवं पर्वतीय क्षेत्रों में कम-से-कम 30 डिग्री सेल्सियस तक पहुँच जाता है तो इसे हीटवेव की स्थिति माना जाता है।
2. वेट बल्ब तापमान उच्च तापमान और निम्न आर्द्रता का एक संयोजन है।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

59. बाघ गणना 2022 के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. बाघ गणना प्रत्येक 5 वर्ष में की जाती है।
2. पश्चिमी घाट में बाघों की आबादी में उल्लेखनीय वृद्धि हुई है।
3. भारत में मिज़ोरम को छोड़कर सभी राज्यों में बाघ पाए जाते हैं।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

60. ग्राफीन के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह कार्बन परमाणुओं की एक परमाणु मोटी परत है।
2. यह हीरे से भी कई गुना ज़्यादा मज़बूत होता है।
3. ऊर्जा और चिकित्सा जगत में इसकी व्यापक उपयोगिताओं के कारण इसे एक महत्त्वपूर्ण पदार्थ के रूप में जाना जाता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

61. निम्नलिखित युग्मों पर विचार कीजिये:

चित्रकला		*राज्य*
1. बसोहली चित्रकला	:	उत्तर प्रदेश
2. गोंड चित्रकला	:	मध्य प्रदेश
3. कांगड़ा चित्रकला	:	सिक्किम

उपर्युक्त में से कितने युग्म सही सुमेलित हैं?

(a) केवल एक
(b) केवल दो
(c) सभी तीन
(d) कोई भी नहीं

62. बढ़ते वाष्पीकरण और जलवायु परिवर्तन के कारण पृथ्वी के जल विज्ञान चक्र पर निम्नलिखित में से कौन-सा सर्वाधिक संभावित प्रभाव हो सकता है?

(a) वाष्पीकरण वृद्धि से मीठे जल के संसाधनों की अधिकता हो जाती है, जिससे जल की कमी वाले क्षेत्रों को लाभ होता है।
(b) उच्च वाष्पीकरण दर सूखे की तीव्रता और मीठे जल की उपलब्धता को कम करने में योगदान करती है।
(c) जलवायु परिवर्तन वाष्पीकरण दर या मीठे जल की उपलब्धता को महत्त्वपूर्ण रूप से प्रभावित नहीं करता है।
(d) वाष्पीकरण में वृद्धि मुख्य रूप से तटीय क्षेत्रों को प्रभावित करती है एवं अंतर्देशीय जल स्रोतों पर इसका न्यूनतम प्रभाव पड़ता है।

63. निम्नलिखित कथनों पर विचार कीजिये:

1. पशुधन के मलमूत्र, सब्ज़ियों के अपशिष्ट जैसे कृषि अपशिष्ट पदार्थों के विगलन से खाद तैयार की जाती है।
2. केंचुआ खाद (वर्मी-कम्पोस्ट) पटसन, मूँग या ग्वार उगाकर एवं इन्हें मृदा में मिश्रित कर तैयार किया जाता है।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1
(b) केवल 2
(c) 1 और 2 दोनों
(d) न तो 1 और न ही 2

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57. With reference to the recently conducted First Waterbodies Census, Consider the following statements:

1. It was conducted by the Ministry of Environment, Forest and Climate Change.
2. Uttar Pradesh accounts for the greatest number of waterbodies in the country.
3. Around 40% of the total water bodies are located in Urban areas.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

58. With reference to heatwaves, consider the following statements:

1. Heat wave is considered if the maximum temperature of a station reaches at least 40°C for plains and at least 30°C for hilly regions.
2. Wet bulb temperature is a combination of high temperature and low humidity.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

59. With reference to Tigers census 2022, consider the following statements:

1. Tiger census is conducted every 5 years.
2. There has been a significant increase in the tiger population in the Western ghats.
3. Tigers are found in all states in India except Mizoram.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

60. With reference to Graphene, consider the following statements:

1. It is a one-atom-thick layer of carbon atoms.
2. It is many times stronger than diamond.
3. It known as a wonder material due to its vast potential in the energy and medical world.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

61. Consider the following pairs:

	Paintings		*State*
1.	Basholi Paintings	:	Uttar Pradesh
2.	Gond Paintings	:	Madhya Pradesh
3.	Kangra painting	:	Sikkim

How many of the above pairs are correctly matched?

(a) Only one
(b) Only two
(c) All three
(d) None

62. Which of the following may be the most possible impact on Earth's hydrological cycle due to increased evaporation and climate change?

(a) Increased evaporation leads to a surplus of freshwater resources, benefiting water-scarce regions.
(b) Higher evaporation rates contribute to the intensification of droughts and reduced freshwater availability.
(c) Climate change does not significantly affect evaporation rates or freshwater availability.
(d) Increased evaporation primarily affects coastal regions and has minimal impact on inland water sources.

63. Consider the following statements:

1. Compost is prepared by the decomposition of farm waste material like livestock excreta, vegetable waste.
2. Vermi-compost is prepared by growing sun hemp or guar and then mulching and ploughing them into the soil.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

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64. गुरुत्वाकर्षण तरंगों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. ये दिक्-काल (स्पेस टाइम) में तरंगें हैं।
2. सबसे दुर्बल तरंगें ब्लैक होल के टकराने से उत्पन्न होती हैं।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

65. निम्नलिखित पर विचार कीजिये:

1. जहाज़ों और पनडुब्बियों की अभिकल्पना
2. लैक्टोमीटर
3. ओडोमीटर
4. थर्मामीटर

उपर्युक्त में से कौन-सा/से आर्किमिडीज़ के सिद्धांत के अनुप्रयोग है/हैं?

(a) केवल एक *(b)* केवल दो
(c) केवल तीन *(d)* सभी चार

66. निम्नलिखित पर विचार कीजिये:

1. वृक्क की पथरी को तोड़ना
2. भ्रूण की जाँच करना
3. पुलों में दरारों का पता लगाना
4. प्रगलन प्रक्रिया

उपर्युक्त में से कौन-सा/से पराध्वनि तकनीक के अनुप्रयोग है/हैं?

(a) केवल एक *(b)* केवल दो
(c) केवल तीन *(d)* सभी चार

67. पात्रे निषेचन (IVF) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसमें नर और मादा युग्मकों को एकत्रित करके प्रयोगशाला में अनुरूपी परिस्थितियों में युग्मनज बनने के लिये प्रेरित किया जाता है।
2. IVF के एक पूर्ण चक्र में लगभग 12 से 13 सप्ताह लगते हैं।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

68. निम्नलिखित कथनों पर विचार कीजिये:

1. हीमोफीलिया एक वंशानुगत रक्त विकार है जिसमें रक्त स्कंदन के लिये ज़िम्मेदार कारकों का अभाव होता है, जिससे रक्तस्राव लंबे समय तक होता है।
2. थैलेसीमिया एक वंशानुगत स्थिति है जो असामान्य, अर्द्धचंद्राकार लाल रूधिर कणिकाओं की उपस्थिति के कारण उत्पन्न होती है।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

69. निम्नलिखित कथनों पर विचार कीजिये:

1. ओपिऑइड्स औषधियों का एक वर्ग है जिसका उपयोग आमतौर पर दर्द निवारण के लिये किया जाता है।
2. मानव शरीर स्वाभाविक रूप से कैनेबिनॉइड्स का संश्लेषण नहीं करता है।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

70. जैवनियंत्रण कारकों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. ये प्राकृतिक जीव हैं जो पौधों के रोगजनकों को नियंत्रित करते हैं।
2. ये विषाक्त रसायनों पर निर्भरता को कम करते हैं।
3. बी. थूरीनजिएसीस जैवनियंत्रण कारक का उदाहरण है।

उपर्युक्त में से कितने कथन सही है?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

71. निम्नलिखित कथनों पर विचार कीजिये:

1. DNA एक जलरोधी अणु है।
2. प्रतिबंधन एंज़ाइम DNA को विशिष्ट स्थान पर काटता है।
3. पुनः संयोजक DNA अणु बनाने के लिये आणविक कैंची का उपयोग किया जाता है।

उपर्युक्त में से कितने कथन सही है?

(a) केवल एक
(b) केवल दो
(c) सभी तीन
(d) कोई भी नहीं

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64. With reference to gravitational waves, consider the following statements:

1. They are ripples in the space-time.
2. The most feeble waves are produced by the colliding black holes.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

65. Consider the following:

1. Designing ships and submarines
2. Lactometers
3. Odometer
4. Thermometer

Which of the above are the application of Archimedes Principle?

(a) Only one *(b)* Only two
(c) Only three *(d)* All four

66. Consider the following:

1. Break stones in kidney
2. Examine the foetus
3. Detect cracks in bridges
4. Smelting process

Which of the above are the applications of Ultrasound technology?

(a) Only one *(b)* Only two
(c) Only three *(d)* All four

67. With reference to In Vitro fertilisation (IVF), consider the following statements:

1. In this, the male and female gametes are collected and induced under simulated conditions in the laboratory.
2. The one full cycle of IVF takes about 12 to 13 weeks.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

68. Consider the following statements:

1. Haemophilia is an inherited blood disorder where the blood lacks certain clotting factors, causing prolonged bleeding.
2. Thalassemia is a hereditary condition caused by the presence of abnormal, crescent-shaped red blood cells.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

69. Consider the following statements:

1. Opioids are a class of drugs commonly used for pain management.
2. Human body does not naturally synthesize cannabinoids.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

70. With reference to Biocontrol Agents, consider the following statements:

1. They are natural organisms that control plant pathogens.
2. They reduce dependence on toxic chemicals.
3. B. Thuringiensis is an example of biocontrol agents.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

71. Consider the following statements:

1. DNA is a hydrophobic molecule.
2. Restriction enzyme cuts the DNA at specific location.
3. Molecular scissors are used to form recombinant DNA molecules.

How many of the above statements are correct?

(a) Only one
(b) Only two
(c) All three
(d) None

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72. RNA अंतरक्षेप के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह केवल उच्च ससीमकेंद्रकी (यूकेरियोटिक) जीवों में होता है।
2. यह एक कोशकीय सुरक्षा तंत्र है।
3. इसमें एक विशिष्ट mRNA को निष्क्रिय करना शामिल है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

73. सेलुलोस के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह विशेष रूप से पादपों में पाया जाता है।
2. यह वनस्पति जगत में सबसे प्रचुर मात्रा में पाया जाने वाला कार्बनिक पदार्थ है।
3. इसका उपयोग वस्त्र और पेय पदार्थों में किया जा सकता है।

उपर्युक्त में से कौन-से कथन सही हैं?

(a) केवल 1 और 2 *(b)* केवल 2 और 3
(c) केवल 1 और 3 *(d)* 1, 2 और 3

74. बिग डेटा के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसमें संरचित और असंरचित दोनों प्रकार के डेटा शामिल हैं।
2. यह पारंपरिक डेटा की तुलना में कम दर पर उत्पन्न होता है।
3. हदूप (Hadoop) और मोगोंडीबी (MongoDB) बिग डेटा उपकण के उदाहरण हैं।

उपर्युक्त में से कौन-से कथन सही हैं?

(a) केवल 1 और 2 *(b)* केवल 2 और 3
(c) केवल 1 और 3 *(d)* 1, 2 और 3

75. भारतीय रिज़र्व बैंक (RBI) की मौद्रिक नीति ढाँचे के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. RBI को हर स्थिति में मुद्रास्फीति दर को 4 प्रतिशत से कम रखना आवश्यक है।
2. RBI की ब्याज दरें बढ़ाने की रणनीति अर्थव्यवस्था में मुद्रास्फीति दर पर आधारित है।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

76. इन्फ्रास्ट्रक्चर इन्वेस्टमेंट ट्रस्ट (InvITs) और रियल एस्टेट इन्वेस्टमेंट ट्रस्ट (REITs) के संदर्भ में निम्नलिखित में से कौन-सा कथन सही है?

1. इन्फ्रास्ट्रक्चर इन्वेस्टमेंट ट्रस्ट (InvITs) मुख्य रूप से बुनियादी ढाँचा परियोजनाओं में निवेश पर केंद्रित हैं।
2. रियल एस्टेट इन्वेस्टमेंट ट्रस्ट (REITs) को म्यूचुअल फंड की तरह ही संरचित किया जाता है और यह रियल एस्टेट में निवेश करने के लिये अत्यधिक अर्थसुलभ तरीका प्रदान करता है।
3. InvITs के विपरीत, REITs स्टॉक एक्सचेंजों पर सूचीबद्ध नहीं हैं।

नीचे दिये गए कूट का प्रयोग कर सही उत्तर चुनिये:

(a) केवल 1 *(b)* केवल 1 और 2
(c) केवल 2 और 3 *(d)* 1, 2 और 3

77. भारत में खनन नियमों के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. भारत का संविधान राज्य सरकारों को उनकी सीमाओं के भीतर अवस्थित खनिजों का स्वामित्व प्रदत्त करता है।
2. भारत का संविधान केंद्र सरकार को भारत के विशेष आर्थिक क्षेत्र (EEZ) के भीतर खनिजों का स्वामित्व प्रदत्त करता है।
3. खनिज विदेश इंडिया लिमिटेड (KABIL) की स्थापना खान और खनिज (विकास और विनियमन) (MMDR) अधिनियम 1957 के तहत की गई है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

78. भारत में महत्त्वपूर्ण खनिजों के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. खान मंत्रालय द्वारा 50 महत्त्वपूर्ण खनिजों की सूची की पहचान की गई है।
2. सौर पैनल, पवन टर्बाइन, बैटरी और इलेक्ट्रिक वाहनों जैसी हरित प्रौद्योगिकियों के लिये महत्त्वपूर्ण खनिज आवश्यक हैं।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

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72. With reference to RNA interference, consider the following statements:

1. It takes place only in higher eukaryotic organisms.
2. It is a cellular defence mechanism.
3. It involves silencing a specific mRNA.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

73. With reference to cellulose, consider the following statements:

1. It occurs exclusively in plants.
2. It is the most abundant organic substance in plant kingdom.
3. It can be used in textile and breweries.

Which of the above statements are correct?

(a) 1 and 2 only *(b)* 2 and 3 only
(c) 1 and 3 only *(d)* 1, 2 and 3

74. With reference to Big Data, consider the following statements:

1. It comprises both structured and unstructured data sets.
2. It generates at lower rate than traditional data sets.
3. Hadoop and MongoDB are examples of big data tools.

Which of the above statements are correct?

(a) 1 and 2 only *(b)* 2 and 3 only
(c) 1 and 3 only *(d)* 1, 2 and 3

75. Consider the following statements with reference to RBI Monetary Policy Framework:

1. RBI is required to keep the inflation rate below 4% in every situation.
2. RBI's strategy of hiking interest rates is based on inflation rate in the economy.

Which of the above statements is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

76. Which of the following statements with reference to Infrastructure Investment Trust (InvITs) and Real Estate Investment Trust (REITs) are correct?

1. InvITs are primarily focused on investing in infrastructure projects.
2. REITs are structured similarly to mutual funds and offer a highly liquid way to invest in real estate.
3. REITs are not listed on stock exchanges, unlike InvITs.

Select the correct answer using the code given below:

(a) 1 only *(b)* 1 and 2 only
(c) 2 and 3 only *(d)* 1, 2 and 3

77. Consider the following statements with reference to mining regulations in India:

1. The Constitution of India mandates the state government to own the minerals located within their boundaries.
2. The Constitution of India mandates the Union government to own the minerals within the Exclusive Economic Zone of India (EEZ).
3. Khanij Bidesh India Ltd. (KABIL) is set up under Mines & Minerals (Development and Regulation) (MMDR) Act of 1957.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

78. Consider the following statements with reference to critical minerals in India:

1. The list of 50 critical minerals is identified by the Ministry of Mines.
2. Critical minerals are essential for green technologies like solar panels, wind turbines, batteries, and electric vehicles.

Which of the above statements is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

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79. निम्नलिखित कथनों पर विचार कीजिये:

1. अर्द्धचालक जर्मेनियम और सिलिकॉन जैसे तत्त्वों से ही बने होते हैं।
2. डायोड, इंटीग्रेटेड सर्किट (IC) और ट्रांजिस्टर सभी अर्द्धचालकों से निर्मित होते हैं।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1
(b) केवल 2
(c) 1 और 2 दोनों
(d) न तो 1 और न ही 2

80. मिशन ऑन एडवांस्ड एंड हाई-इम्पैक्ट रिसर्च (MAHIR) के संदर्भ में निम्नलिखित कथनों पर विचार कीजिये:

1. इस पहल का उद्देश्य केवल भारत के विद्युत क्षेत्र में उभरती प्रौद्योगिकियों की पहचान करना और विकसित करना है।
2. यह मेक इन इंडिया और स्टार्ट-अप इंडिया जैसी पहलों का समर्थन करेगा और संयुक्त राष्ट्र के सतत् विकास लक्ष्यों (SDG) में योगदान देगा।
3. यह विद्युत मंत्रालय और भारी उद्योग मंत्रालय की एक संयुक्त पहल है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक
(b) केवल दो
(c) सभी तीन
(d) कोई भी नहीं

81. स्वचालित ट्रेन सुरक्षा (ATP) प्रणाली कवच के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसे इज़राइल के साथ प्रौद्योगिकी हस्तांतरण समझौते के तहत विकसित किया गया है।
2. इसमें दुर्घटना की त्रुटि की संभावना लगभग नगण्य है।
3. कोहरे की स्थिति में जब दृश्यता कम होती है तो यह पूरी तरह से काम करता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक
(b) केवल दो
(c) सभी तीन
(d) कोई भी नहीं

82. RBI द्वारा आरंभ किये गए मंच 'अंतर्दृष्टि' का उद्देश्य है

(a) प्रत्यक्ष लाभ अंतरण संबंधी शिकायत करना
(b) वित्तीय धोखाधड़ी से संबंधित शिकायत करना
(c) वित्तीय समावेशन की वृद्धि का आकलन और निगरानी करना
(d) सहकारी बैंकों तथा लघु वित्त बैंकों के विकास का आकलन और निगरानी करना

83. निम्नलिखित क्षेत्रों पर विचार कीजिये:

1. अर्द्धचालक
2. खाद्य प्रसंस्करण
3. मीडिया और मनोरंजन उद्योग
4. तकनीकी प्रयोज्यता हेतु वस्त्र
5. LED रजत प्रदीप्ति उत्पाद
6. पर्यटन

उपर्युक्त में से कितने क्षेत्र उत्पादन-आधारित प्रोत्साहन (PLI) योजना का हिस्सा हैं?

(a) केवल दो
(b) केवल तीन
(c) केवल चार
(d) केवल पाँच

84. निम्नलिखित युग्मों पर विचार कीजिये:

प्राकृतिक स्रोत		*अम्ल*
1. चींटी का डंक	:	लैक्टिक अम्ल
2. सिरका	:	ऐसीटिक अम्ल
3. इमली	:	टार्टरिक अम्ल
4. टमाटर	:	फॉर्मिक अम्ल

उपर्युक्त में से कितने युग्म सही सुमेलित हैं?

(a) केवल एक *(b)* केवल दो
(c) केवल तीन *(d)* सभी चार

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79. Consider the following statements:

1. Semiconductors are made of elements like germanium and silicon only.
2. A diode, integrated circuit (IC) and transistor are all made from semiconductors.

Which of the above statements is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

80. Consider the following statements with reference to Mission on Advanced and High-Impact Research (MAHIR):

1. This initiative aims to identify and develop emerging technologies in the power sector within India only.
2. This will support initiatives like Make in India and Start-up India and contribute to the United Nations' Sustainable Development Goals (SDGs).
3. It is a joint initiative of the Ministry of Power and the Ministry of Heavy Industries.

How many of the above statements are correct?

(a) Only one
(b) Only two
(c) All three
(d) None

81. Consider the following statements with reference to KAVACH, an Automatic Train Protection (ATP) system:

1. It is developed under technology transfer agreement with Israel.
2. It has an almost negligible probability of error of accident.
3. It works perfectly in foggy conditions when visibility is low.

How many of the above statements are correct?

(a) Only one
(b) Only two
(c) All three
(d) None

82. 'Antardrishti' a platform launched by RBI for the purpose of

(a) direct benefit transfers related complaints
(b) financial fraud related complaints
(c) to assess and monitor the growth of financial inclusion
(d) to assess and monitor the growth of cooperative banks and small finance banks

83. Consider the following sectors:

1. Semiconductor
2. Food processing
3. Media and entertainment industry
4. Technical textiles
5. LED lightening products
6. Tourism

How many of the above sectors are part of the Production Linked Incentive (PLI) Scheme?

(a) Only two
(b) Only three
(c) Only four
(d) Only five

84. Consider the following pairs:

	Natural Source		*Acid*
1.	Ant sting	:	Lactic acid
2.	Vinegar	:	Acetic acid
3.	Tamarind	:	Tartaric acid
4.	Tomato	:	Formic acid

How many pairs given above are correctly matched?

(a) Only one *(b)* Only two
(c) Only three *(d)* All four

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85. निम्नलिखित कथनों पर विचार कीजिये:

1. अलैंगिक जनन में पादप बिना बीज के भी नए पादप उत्पन्न कर सकते हैं।
2. लैंगिक जनन में नए पादप बीजों से उत्पन्न होते हैं।
3. कायिक प्रवर्द्धन एक प्रकार का अलैंगिक प्रजनन होता है जिसमें मूल, तनों, पत्तियों और कलियों से नए पौधे उत्पन्न होते हैं।

उपर्युक्त में से कौन-सा कथन सही है?

(a) केवल 1 और 2 *(b)* केवल 2 और 3
(c) केवल 1 और 3 *(d)* 1, 2 और 3

86. निम्नलिखित पर विचार कीजिये:

1. उर्ध्वपातन 2. अवचूर्णन
3. भर्जन 4. विद्युत-लेपन

उपर्युक्त में से कौन-सा/से भौतिक परिवर्तन है/हैं?

(a) केवल 1 और 2 *(b)* केवल 2, 3 और 4
(c) केवल 1, 3 और 4 *(d)* 1, 2, 3 और 4

87. निम्नलिखित कथनों पर विचार कीजिये:

1. तने के ऊपर वृक्ष का ऊपरी शाखायुक्त भाग शिखर कहलाता है।
2. वृक्ष वितान किसी वृक्ष का शीर्ष भाग है जो शाखाओं और पत्तियों से बना होता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

88. निम्नलिखित पर विचार कीजिये:

1. चमगादड़ 2. तितलियाँ
3. हमिंग बर्ड 4. भृंग

उपर्युक्त में कौन-से परागण कारक हैं?

(a) केवल 1 और 2 *(b)* केवल 2, 3 और 4
(c) केवल 1, 3 और 4 *(d)* 1, 2, 3 और 4

89. निम्नलिखित कथनों पर विचार कीजिये:

1. वे पदार्थ जो स्वयं से ऊष्मा को आसानी से प्रवाहित होने देते है उन्हें ऊष्मा का चालक कहते हैं।
2. वे पदार्थ जो स्वयं से होकर ऊष्मा को आसानी से प्रवाहित नही होने देते हैं उन्हें ऊष्मा का कुचालक कहते हैं।
3. गहरे रंग की वस्तुएँ हल्के रंग की वस्तुओं की अपेक्षा ऊष्मीय विकिरणों को कम अवशोषित करती हैं।

उपर्युक्त में से कौन-सा कथन सही है?

(a) केवल 1 और 2 *(b)* केवल 2 और 3
(c) केवल 1 और 3 *(d)* 1, 2 और 3

90. निम्नलिखित कथनों पर विचार कीजिये:

1. ऊतक कोशिकाओं का एक समूह है जो किसी जीव में विशेष कार्य को संपादित करता है।
2. पादपों के सभी भागों तक भोजन के परिवहन के लिये संवहन ऊतक को ज़ाइलम कहा जाता है।
3. पादपों में जल और पोषक तत्त्वों के परिवहन के लिये संवहन ऊतक को फ्लोएम कहा जाता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक
(b) केवल दो
(c) सभी तीन
(d) कोई भी नहीं

91. निम्नलिखित कथनों पर विचार कीजिये:

1. यकृत शरीर की सबसे बड़ी ग्रंथि है।
2. यकृत से स्रावित पित्त रस वसा के पाचन में महत्त्वपूर्ण भूमिका निभाता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न 2

92. निम्नलिखित कथनों पर विचार कीजिये:

1. अधिकांश अकशेरुकी जीवों में उत्सर्जन तंत्र की कार्यात्मक इकाई को मैलपीगी नलिकाएँ कहा जाता है।
2. नेफ्रॉन वृक्क की कार्यात्मक इकाई है जो रक्त को निस्पंदित करने और मूत्र के उत्पादन के लिये ज़िम्मेदार होता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1
(b) केवल 2
(c) 1 और 2 दोनों
(d) न तो 1 और न 2

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85. Consider the following statements:

1. In asexual reproduction plants can give rise to new plants without seeds.
2. In sexual reproduction, new plants are obtained from seeds.
3. Vegetative propagation is a type of asexual reproduction in which new plants are produced from roots, stems, leaves and buds.

Which of the above statements are correct?

(a) 1 and 2 only *(b)* 2 and 3 only
(c) 1 and 3 only *(d)* 1, 2 and 3

86. Consider the following:

1. Sublimation 2. Grinding
3. Baking 4. Electroplating

Which of the above is/are physical changes?

(a) 1 and 2 only *(b)* 2, 3 and 4 only
(c) 1, 3 and 4 only *(d)* 1, 2, 3 and 4

87. Consider the following statements:

1. The upper branchy part of the tree above the bole is called crown.
2. A tree canopy is the top portion of a tree composed of branches and leaves.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

88. Consider the following:

1. Bat 2. Butterflies
3. Hummingbirds 4. Beetles

Which of the above are pollinating agents?

(a) 1 and 2 only *(b)* 2, 3 and 4 only
(c) 1, 3 and 4 only *(d)* 1, 2, 3 and 4

89. Consider the following statements:

1. The materials which allow heat to pass through them easily are conductors of heat.
2. The materials which do not allow heat to pass through them easily are called insulators.
3. Dark-coloured objects absorb less heat than the light-coloured objects.

Which of the statements given above are correct?

(a) 1 and 2 only *(b)* 2 and 3 only
(c) 1 and 3 only *(d)* 1, 2 and 3

90. Consider the following statements:

1. A tissue is a group of cells that perform specialised function in an organism.
2. The vascular tissue for transport of food to all parts of the plant is called xylem.
3. The vascular tissue for the transport of water and nutrients in the plant is called phloem.

How many of the above statements are correct?

(a) Only one
(b) Only two
(c) All three
(d) None

91. Consider the following statements:

1. The liver is the largest gland in the body.
2. The bile juice secreted from liver plays an important role in the digestion of fats.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

92. Consider the following statements:

1. The functional unit of the excretory system in most invertebrates is called the Malpighian tubule.
2. Nephron is the functional unit of the kidney responsible for filtering blood and producing urine.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

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93. निम्नलिखित कथनों पर विचार कीजिये:

1. केंचुओं में श्वसन आर्द्र त्वचा के माध्यम से होता है।
2. मछलियों में श्वसन क्लोम के माध्यम से होता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 न ही 2

94. निम्नलिखित कथनों पर विचार कीजिये:

1. लैक्टोबैसिलस जीवाणु दही के निर्माण को बढ़ावा देता है।
2. चावल इडली और डोसा बैटर के किण्वन के लिये बैक्टीरिया और यीस्ट सहायक होते हैं।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1
(b) केवल 2
(c) 1 और 2 दोनों
(d) न तो 1 और न 2

95. निम्नलिखित कथनों पर विचार कीजिये:

1. एंथ्रेक्स संक्रमण एक पशुजन्य (जूनोटिक) संक्रमण है जो बेसीलस एन्थ्रेसिस नामक जीवाणु के कारण होता है।
2. गाय में खुर एवं मुँह का रोग विषाणु द्वारा होता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न 2

96. निम्नलिखित कथनों पर विचार कीजिये:

1. मिट्टी को उलटने-पलटने एवं पोला करने की प्रक्रिया जुताई कहलाती है।
2. अनाज को फटककर भूसी से अलग करना निष्पावन कहलाता है।
3. कटाई का अर्थ पकी हुई फसल को हाथों या मशीन से काटना है।

उपर्युक्त कथनों में से कौन-से सही हैं?

(a) केवल 1 और 2 *(b)* केवल 2 और 3
(c) केवल 1 और 3 *(d)* 1, 2 और 3

97. निम्नलिखित कथनों पर विचार कीजिये:

1. मोबाइल फोन में गाइरोस्कोप सेंसर (Gyroscope Sensor) फोन के अभिविन्यास का पता लगाता है।
2. एक्सेलेरोमीटर सेंसर (Accelerometer Sensor) हाथ के घूमने या मुड़ने को ट्रैक करता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

(a) केवल 1
(b) केवल 2
(c) 1 और 2 दोनों
(d) न तो 1 और न 2

98. क्लाउड कंप्यूटिंग (Cloud Computing) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह डेटा भंडारण और प्रसंस्करण के लिये विशेष रूप से स्थानीय हार्डवेयर और बुनियादी ढाँचे पर निर्भर करता है।
2. इसकी सभी सेवाएँ 'पे-एज-यू-गो' (pay-as-you-go) मूल्य निर्धारण मॉडल पर आधारित हैं।
3. यह डेटा बैकअप और आपदा पुनर्प्राप्ति योजना की आवश्यकता को पूरी तरह से समाप्त कर देता है।

उपर्युक्त में से कितने कथन सही हैं?

(a) केवल एक *(b)* केवल दो
(c) सभी तीन *(d)* कोई भी नहीं

99. निम्नलिखित कथनों पर विचार कीजिये:

1. द्रवीकरण प्राकृतिक गैस को द्रव्य रूप में परिवर्तित करने की प्रक्रिया है।
2. प्राकृतिक गैस मुख्य रूप से मीथेन से बनी होती है और एक स्वच्छ दहन वाला जीवाश्म ईंधन है।

उपर्युक्त में से कौन-सा/से कथन सही है/हैं?

(a) केवल 1 *(b)* केवल 2
(c) 1 और 2 दोनों *(d)* न तो 1 और न ही 2

100. निम्नलिखित पर विचार कीजिये:

1. मौसम संबंधी पूर्वानुमान
2. दूरदर्शन प्रसारण
3. दूरसंचार
4. सुदूर संवेदन

उपर्युक्त में से कौन-से कृत्रिम उपग्रहों का अनुप्रयोग हैं?

(a) केवल 1 और 2 *(b)* केवल 2, 3 और 4
(c) केवल 1, 3 और 4 *(d)* 1, 2, 3 और 4

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93. Consider the following statements:

1. In earthworms, the exchange of gases occurs through the moist skin.
2. In fishes, the exchange of gases takes place through gills.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

94. Consider the following statements:

1. The bacterium Lactobacillus promotes the formation of curd.
2. Bacteria and yeast are helpful for fermentation of rice idlis and dosa batter.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

95. Consider the following statements:

1. Anthrax infection is a zoonotic caused by bacteria called Bacillus anthracis.
2. Foot and mouth disease of cattle is caused by a virus.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

96. Consider the following statements:

1. The process of loosening and turning of the soil is called tilling.
2. Separation of the grains from the chaff is called winnowing.
3. Harvesting is the cutting of the mature crop manually or by machines.

Which of the statements given above are correct?

(a) 1 and 2 only *(b)* 2 and 3 only
(c) 1 and 3 only *(d)* 1, 2 and 3

97. Consider the following statements:

1. The gyroscope sensor in the mobile phones detects the orientation of the phone.
2. The accelerometer sensor tracks the rotation or twist of the hand.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

98. With reference to Cloud Computing, consider the following statements:

1. It relies exclusively on local hardware and infrastructure for data storage and processing.
2. All of its services are based on pay-as-you-go pricing model.
3. It completely eliminates the need for data backup and disaster recovery planning.

How many of the above statements are correct?

(a) Only one *(b)* Only two
(c) All three *(d)* None

99. Consider the following statements:

1. Liquefaction is the process of converting natural gas into liquid form.
2. Natural gas is primarily composed of methane and is a clean-burning fossil fuel.

Which of the statements given above is/are correct?

(a) 1 only *(b)* 2 only
(c) Both 1 and 2 *(d)* Neither 1 nor 2

100. Consider the following:

1. Weather forecasting
2. Television transmission
3. Telecommunication
4. Remote sensing

Which of the above are applications of artificial satellites?

(a) 1 and 2 only *(b)* 2, 3 and 4 only
(c) 1, 3 and 4 only *(d)* 1, 2, 3 and 4

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TEST BOOKLET SERIES

Test Code: P1/P2-2407

TEST BOOKLET
GENERAL STUDIES

TEST – 07

C

Time Allowed : Two Hours **Maximum Marks : 200**

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1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET *DOES NOT* HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES CODE **A, B, C** OR **D** AS THE CASE MAY BE IN THE APPROPRIATE PLACE IN THE ANSWER SHEET.
3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside this line. *DO NOT* write *anything else* on the Test Booklet.
4. This Test Booklet contains 100 items (questions). Each question is printed both in **Hindi** and **English**. Each item comprises four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each item.
5. You have to mark all your responses ONLY on the separate Answer Sheet provided. See directions in the Answer sheet.
6. All items carry equal marks.
7. Before you proceed to mark in the Answer Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instructions sent to you with your admission certificate.
8. After you have completed filling in all your responses on the Answer Sheet and examination has concluded, you should hand over to the Invigilator *only the Answer Sheet*. You are permitted to take away with you the Test Booklet.
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10. **Penalty for wrong answers:**
    THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBJECTIVE TYPE QUESTION PAPERS.
    (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **One-Third** of the marks assigned to that question will be deducted as penalty.
    (ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above to that question.
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TEST BOOKLET SERIES

Test Code: P1/P2-2407

(English Version)

ANSWER & EXPLANATION
GENERAL STUDIES
TEST – 07

C

ANSWERS

Q. No.	Answers	Q. No.	Answers	Q. No.	Answers	Q. No.	Answers
1	(b)	26	(d)	51	(d)	76	(b)
2	(d)	27	(d)	52	(b)	77	(b)
3	(b)	28	(d)	53	(b)	78	(b)
4	(c)	29	(c)	54	(c)	79	(b)
5	(b)	30	(d)	55	(c)	80	(a)
6	(b)	31	(c)	56	(b)	81	(b)
7	(a)	32	(a)	57	(d)	82	(c)
8	(a)	33	(b)	58	(a)	83	(c)
9	(c)	34	(d)	59	(d)	84	(b)
10	(c)	35	(a)	60	(c)	85	(d)
11	(d)	36	(a)	61	(a)	86	(a)
12	(a)	37	(c)	62	(b)	87	(c)
13	(b)	38	(a)	63	(a)	88	(d)
14	(c)	39	(b)	64	(a)	89	(a)
15	(c)	40	(b)	65	(b)	90	(a)
16	(b)	41	(d)	66	(c)	91	(c)
17	(d)	42	(b)	67	(a)	92	(c)
18	(c)	43	(b)	68	(a)	93	(c)
19	(d)	44	(d)	69	(a)	94	(c)
20	(a)	45	(d)	70	(c)	95	(c)
21	(b)	46	(d)	71	(b)	96	(c)
22	(c)	47	(b)	72	(b)	97	(d)
23	(d)	48	(b)	73	(d)	98	(d)
24	(c)	49	(d)	74	(c)	99	(c)
25	(b)	50	(b)	75	(b)	100	(d)

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1. (b)

Explanation:

- **Fat is the body's most concentrated source of energy,** providing more than twice as much potential energy as carbohydrates or protein (9 calories per gram versus 4 calories each per gram) **Hence, option (b) is correct.**
- **Carbohydrates** when consumed are **broken down** in the body **into glucose,** which is used by cells as a primary source of energy.
- **Vitamins** are **essential micronutrients** that play various roles in maintaining good health, such as supporting immune function and facilitating various biochemical processes. However, vitamins **do not serve as** a **direct source of energy** like carbohydrates.
- **Minerals** are also essential micronutrients that play vital roles in various bodily functions, including **bone health** and **nerve function.** However, they do not provide energy in the same way as fats, carbohydrates or proteins.
- **Proteins** are essential for **growth, repair,** and **maintenance of tissues** in the body. While proteins do contribute to the overall energy balance in the diet, they are not the primary source of concentrated energy. In the absence of carbohydrates and fats, proteins can be used as an energy source, but their primary role is in tissue building and repair.

2. (d)

Explanation:

- **Translucent materials** exhibit a unique behaviour when interacting with light. Unlike transparent materials, which allow light to pass through with minimal scattering, and opaque materials, which completely block the passage of light, **translucent materials allow light to penetrate to some extent but scatter it in various directions.** This scattering effect **results** in a **hazy or diffused appearance. Hence, option (d) is correct.**
- Common **examples** of translucent materials include **frosted glass, wax paper,** and certain types of plastics.
- When light enters a translucent material, it doesn't pass through as cleanly as it does in transparent materials. Instead, the **light gets absorbed** and then **re-emitted in multiple directions within the material.**
- This **scattering of light causes the material to appear cloudy** or **semi-transparent,** making objects on the other side less distinct or blurred.
- This property of translucency is often desirable in applications where some level of privacy or diffusion of light is needed, such as in **bathroom windows** or lampshades.
- It allows a soft and gentle illumination while partially concealing objects on the other side, striking a **balance** between **transparency** and **opacity**.

3. (b)

Explanation:

- **Threshing:** It is a method used for **separating grains** from the **stalks** and **husks of plants,** typically after harvesting. It is not used for separating a mixture of solid and liquid; rather, it is employed in agriculture to separate different parts of plant materials. It's not a method of separating a mixture of solid and liquid.
- **Winnowing:** It is a technique used to **separate lighter chaff** or husk **from heavier seeds** or grains. It involves tossing the mixture into the air, allowing the wind to blow away the lighter components. It is also not used for separating a mixture of solid and liquid but rather for separating solid components of different densities. It's not a method of separating a mixture of solid and liquid.
- **Evaporation:** This method involves **heating the mixture to evaporate the liquid component,** leaving behind the solid. It is commonly used when you want to separate a dissolved solid from a liquid, such as separating salt from saltwater. It's a method of separating a mixture of solid and liquid.
- **Filtration:** It is used when you have a **mixture of solid particles suspended in a liquid.** It involves passing the mixture through a filter, which allows the liquid to pass through while trapping the solid particles. This method is often used to separate solids like sand or impurities from liquids. It's a method of separating a mixture of solid and liquid.
- **Sieving:** It is used to **separate smaller solid particles from larger ones** or to separate a mixture of solid particles of different sizes. It involves passing the mixture through a sieve or mesh, and the smaller particles fall through while the larger ones are retained. Sieving is typically used for dry mixtures. It's can also be used as a method of separating a mixture of solid and liquid. **Hence, option (b) is correct.**

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4. (c)

Explanation:

- Photosynthesis is the fundamental process by which green plants, algae, and some bacteria **capture light energy** from the sun and **convert it into chemical energy** stored in the form of glucose and other organic compounds.
- This **chemical energy serves as a primary source of energy for the plant** and is essential for its growth and development**. Hence, statement (1) is correct.**
- Photosynthesis is the **most efficient** in utilizing light energy in the **blue** and **red regions** of the visible light spectrum. While plants can perform photosynthesis across a broader spectrum of light, **violet light is less effective** in driving the photosynthetic process. **Hence, statement (2) is NOT correct.**
- **Chlorophyll,** the **green pigment** found in **chloroplasts of plant cells,** acts as a photoreceptor. It absorbs light energy, particularly in the blue and red wavelengths, and initiates the photosynthesis process by converting this energy into chemical reactions. So, Chlorophyll is photoreceptor molecule which trap solar energy. **Hence, statement (3) is correct.**
- Photosynthesis consists of two main stages: the light-dependent reactions and the light-independent reactions. During these processes, there are **oxidation-reduction reactions** where **water is oxidized,** and **carbon dioxide is reduced**, leading to the **production of glucose** and the **release of oxygen. Hence, statement (4) is correct.**

5. (b)

Explanation:

- **Shrubs:** Shrubs are typically characterized by their **relatively larger size** compared to **herbs.** They are **woody plants** with **multiple stems** or branches arising from the base and generally have a height greater than 1 meter. Shrubs have a well-developed woody stem structure that persists even during the winter months. Examples of shrubs include **rose bushes, lilacs, and hibiscus plants.**
- **Herbs:** Herbs, on the other hand, are **smaller plants in terms of height.** They **lack the prominent woody stem structure** of shrubs and usually have a soft, green stem. Herbs are typically shorter, with a **maximum height of around 1 meter.** They are often annual or perennial plants that complete their life cycle within a year or live for several years. Examples of herbs include **basil, mint**, and **cilantro.**
- While the size of leaves, type of flowers, and depth of roots can also provide valuable information about a plant, the most straightforward and commonly used characteristic to distinguish between shrubs and herbs is the height of the plant. **Shrubs tend to be taller, while herbs are typically shorter in stature. Hence, option (b) is correct.**

6. (b)

Explanation:

- **Adaptation,** in the context of biological evolution, refers to the **gradual process** by which populations of organisms develop and inherit traits that enhance their survival and reproduction in a specific environment.
- **Evolutionary Process:** Adaptation is not an individual-level phenomenon but rather a **population-level process.** It occurs over **multiple generations** as genetic variations within a population lead to the emergence of traits that **offer a survival or reproductive advantage** in a particular environment.
- **Better Suited Traits:** Adaptation results in the **accumulation of traits** that are better suited to the environmental conditions in which a species lives. These traits can include **physical characteristics, behaviors, or physiological processes** that help organisms thrive in their **specific niche.**
- **Natural Selection:** The driving force behind adaptation is natural selection. **Individuals with advantageous traits have a higher chance of surviving and reproducing,** passing those traits to their offspring. Over time, these advantageous traits become more common in the population.
- **Environmental Influence:** Adaptation is a response to the selective pressures exerted by the environment. As **environmental conditions change,** species may need to adapt to new challenges and opportunities. **Hence, statement (I) and statement (II) are correct but statement (II) is NOT the correct explanation for statement (I).**

7. (a)

Explanation:

- **Unstriped muscles,** also known as **smooth muscles,** are found in the **walls of internal organs** such as the

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stomach, intestines, and blood vessels. Unlike skeletal (striped) muscles, which are under conscious control and responsible for voluntary movements, smooth muscles function involuntarily.

- These muscles are responsible for **involuntary movements,** such as the contractions of the digestive system, and are not under voluntary control. **Hence, statement (1) is NOT correct.**
- **Cardiac muscle** is found in the heart and is responsible for its **rhythmic contractions,** which pump blood throughout the body. Cardiac muscle **contracts and relaxes involuntarily** to **maintain** the **circulation of blood.** Cardiac muscle is a specialized type of muscle tissue found exclusively in the heart. **Hence, statement (2) is correct.**
- **Striped muscles,** also known as **skeletal muscles,** are attached to the bones and are **responsible** for **voluntary movements,** such as **walking** or lifting objects.
- Normally one or both of the ends of these muscles connect with bones. The alimentary canal (digestive tract) and blood vessels contain smooth muscle, not striped muscle. **Hence, statement (3) is NOT correct.**

8. (a)

Explanation:

- The movement of a body following a **circular path is called a circular motion.** Now, the motion of a body moving with **constant speed along a circular path** is called **Uniform Circular Motion.** Here, the speed is constant but the velocity changes. **Hence, option (a) is correct.**
- This change in direction means that the **object** is always **accelerating,** and speed remains constant. This acceleration is directed toward the center of the circle and is called **centripetal acceleration.**
- The speed of the object can remain constant if the magnitude (or numerical value) of its velocity remains the same.
- However, since the direction keeps changing, the **velocity** (a vector quantity) is **constantly changing.**
- This means the object is undergoing acceleration, which is why the speed remains constant but not the velocity.
- While the **linear speed** (the speed along the circular path) may stay **constant,** the **angular speed** (the rate at which the object traverses the angle around the circle) can **vary.**
- This variation in angular speed is necessary to maintain constant linear speed while changing direction.
- In circular motion, the object's speed remains constant in terms of magnitude, but its velocity changes continuously due to the changing direction.

9. (c)

Explanation:

- **Shadows** are formed when **an object blocks** or obstructs **the path of light.** This happens because **light travels in straight lines,** known as rays.
- **When** an **object is placed in** the **path of these light rays, it prevents some of them from continuing their straight-line path.** As a result, the **area behind** the object, where the **light rays are blocked, remains in shadow. Hence, statement (I) is correct.**
- The key concept here is that light cannot travel through solid objects, and when it encounters an opaque object (an object that doesn't allow light to pass through), it creates a shadow by preventing the light from reaching the surface or area behind it.
- For example, when the sun is shining, objects like trees, buildings, etc. can cast shadows on the ground.
- The **size and shape of the shadow** depend on the relative position of the light source (such as the sun or a lamp) and the object, as well as the angle at which the light rays strike the object.
- Bending of light is a phenomenon of **refraction of light** and it has no role pertaining with formation of shadow. **Hence, statement (II) is NOT correct.**

10. (c)

Explanation:

- When a magnet is freely suspended, it tends to align itself with the Earth's magnetic field. The **Earth acts as** a **giant magnet,** with its **magnetic North pole** roughly located **near** the **geographic South pole** and its **magnetic South pole near** the **geographic North pole.**
- Due to this arrangement, the **North pole of a freely suspended magnet is attracted** to the **Earth's magnetic South pole,** causing the magnet to **align** in a **North-South direction.**
- This property is the basis for the operation of compasses, which use a freely suspended magnet to indicate geographic North. **Hence, statement (1) is correct.**

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- One of the **fundamental principles of magnetism** is known as the **law of magnetic poles.** According to this law, **magnetic poles of opposite polarity** (North and South) are **attracted** to each other, while magnetic poles of the same polarity (North and North or South and South) repel each other. **Hence, statement (2) is correct.**
- This behavior can be observed when bringing two magnets close together, as they will either attract or repel each other based on the orientation of their poles.

11. (d)

Explanation:

- Water vapor is indeed added to the air through the processes of evaporation and transpiration. **Hence, statement (1) is correct.**
- **Evaporation:** This process involves the **conversion of liquid water into water vapor** (a gaseous state) from various surfaces like the ocean, rivers, lakes, and even moist soil.
- When the Sun's energy heats up water bodies or wet surfaces, it causes water molecules to gain enough energy to escape into the air as water vapor.
- This moisture then becomes part of the air, increasing its humidity.
- **Transpiration:** It is the release of water vapor from the stomata (tiny openings) in plant leaves. As plants take up water from the soil through their roots, they transport it to their leaves.
- In the leaves, **water molecules evaporate from** the **leaf surfaces** into the air through small pores. This process not only contributes to the moisture content of the surrounding air but also aids in plant cooling and nutrient transport.
- In aquatic environments, oxygen from the atmosphere can dissolve into the water.
- Aquatic animals, such as **fish,** have **specialized respiratory structures like gills** that allow them to extract dissolved oxygen directly from the water. These gills contain thin membranes through which oxygen diffuses from the water into the bloodstream while simultaneously expelling carbon dioxide waste into the water. **Hence, statement (2) is correct.**

12. (a)

Explanation:

- A **voltmeter** is an electrical measuring instrument used to **quantify** the **electric potential difference,** also known as voltage, between two points in an electrical circuit.
- It typically displays readings in volts and is crucial for assessing and monitoring voltage levels in various electronic and electrical systems to ensure proper functioning. **Hence, pair (1) is correctly matched.**
- An **ammeter** is an electrical instrument designed to measure the flow of electric current in a circuit. It typically consists of a calibrated coil of wire and a pointer that moves in response to current passing through it. Ammeters are crucial for monitoring and **quantifying current levels,** ensuring proper electrical system operation. **Hence, pair (2) is NOT correctly matched.**
- A **galvanometer** typically consists of a coil of wire within a magnetic field, which deflects a pointer in response to current flow.
- This device is used on electrical circuits to know and measure the intensity and **direction of electrical current.** It serves as the basis for various instruments like ammeters and voltmeters, aiding in electrical measurements. **Hence, pair (3) is NOT correctly matched.**

13. (b)

Explanation:

- **Bacteria** can exhibit various modes of nutrition. **Autotrophic bacteria** are capable of synthesizing their own food from inorganic substances, such as through photosynthesis (like cyanobacteria) or chemosynthesis.
- **Heterotrophic bacteria,** on the other hand, obtain their nutrition by consuming organic substances, such as other organisms or organic matter. **Hence, statement (1) is correct.**
- Bacteria are the **most abundant micro-organisms on Earth.** They can be found in various environments, including soil, water, the human body, and many others.
- Their ubiquity and diversity make them highly abundant and play essential roles in various ecosystems. **Hence, statement (2) is correct.**
- **Bacteria** are **known for their remarkable adaptability,** and many bacterial species are capable of surviving in extreme environments.
- **Extremophiles** are bacteria that thrive in extreme conditions, such as high temperatures (thermophiles), acidic environments (acidophiles), alkaline environments (alkaliphiles), high-pressure environments (barophiles), and even environments with high radiation levels. **Hence, statement (3) is NOT correct.**

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14. (c)

Explanation:

- **The human body is primarily composed of four major elements:** oxygen (O), carbon (C), hydrogen (H), and nitrogen (N). These elements make up more than 99% of the body's mass. Among them, **oxygen is the most abundant element.**
- It is a vital component of water (H2O) and is found in various organic molecules essential for life, such as carbohydrates, proteins, and fats. **Hence, option (c) is correct.**
- While carbon, hydrogen, and nitrogen are also essential elements in the body, they are present in slightly lower percentages compared to oxygen.
- **Carbon is the second most abundant element in the body,** followed by hydrogen and nitrogen. Together, these elements form the building blocks of organic compounds and play crucial roles in the structure and function of biological molecules.
- So, in summary, oxygen constitutes the maximum percentage in the human body due to its **essential role in various biological processes** and its presence in water and organic compounds.

15. (c)

Explanation:

- **Plasma** is the **liquid component of blood** and constitutes the major portion of blood by volume. It makes up about **55% of the total blood volume. Hence, statement (1) is correct.**
- Plasma is a **pale-yellow fluid** that carries various components of the blood, including red blood cells, white blood cells, platelets, nutrients, hormones, waste products, and dissolved gases.
- In the **ABO blood group system,** there are **two antigens (A and B)** and two corresponding antibodies (anti-A and anti-B). Depending on which antigens are present on the surface of red blood cells, an individual's blood type is classified as **A, B, AB, or O.**
- The presence or absence of the **Rh factor** (an antigen called the D antigen) further categorizes blood as Rh-positive or Rh-negative. **Hence, statement (2) is correct.**
- **Platelets, also known as thrombocytes,** play a crucial role in the coagulation (clotting) of blood. When a blood vessel is damaged, platelets become activated and adhere to the site of injury.
- They **release chemical signals** that promote the formation of a blood clot.
- The clot, consisting of a mesh of fibrin (a protein) and trapped blood cells, helps to stop bleeding and facilitate the healing process. **Hence, statement (3) is correct.**

16. (b)

Explanation:

- **Type 1 diabetes** is an autoimmune disease in which the body's immune system mistakenly attacks and destroys insulin-producing beta cells in the pancreas. It is not primarily caused by lifestyle factors. It generally happens at an early age. **Hence, statement (1) is NOT correct.**
- **Type 2 diabetes** is primarily characterized by insulin resistance, where the body's cells do not respond effectively to insulin. It is not typically associated with an autoimmune response that destroys insulin-producing cells. It is most common among older people. **Hence, statement (2) is NOT correct.**
- **Insulin is a hormone** that helps regulate blood sugar levels. Insulin is a hormone produced by the pancreas that plays a crucial role in regulating blood sugar levels. It allows cells in the body to take in glucose from the bloodstream, lowering blood sugar levels. **Hence, statement (3) is correct.**

17. (d)

Explanation:

- **Chlorine** is produced during the **electrolysis of aqueous sodium chloride (brine).** This chlorine gas is used for the **manufacture of bleaching powder.**
- It is a **pale-yellow coloured powder** with a very strong smell of chlorine.
- Bleaching powder is produced by the action of chlorine on dry slaked lime [Ca(OH)2]. Bleaching powder is represented as **CaOCl2.**
- **Bleaching powder is used:**
  - for bleaching cotton and linen in the textile industry,
  - for bleaching wood pulp in paper factories and for bleaching washed clothes in laundry;
  - as an oxidising agent in many chemical industries; and
  - to make drinking water free from germs. **Hence, option (d) is correct.**

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18. (c)

Explanation:

- **All metals except mercury exist as solids at room temperature. Hence, statement (1) is correct.**
- Metals have high melting points, but **gallium and caesium** have very low melting points. These two metals will **melt if you keep them on your palm.**
- Iodine is a non-metal, but it is lustrous, and **carbon is a non-metal that can exist in different forms. Each form is called an allotrope. Hence, statement (2) is correct.**
- Some of the other examples of non-metals are sulphur, iodine, oxygen, hydrogen, etc. The non-metals are either solids or gases except bromine which is a liquid
- **Alkali metals (lithium, sodium, potassium) are so soft** that they can be cut with a knife. They have low densities and low melting points. **Hence, statement (3) is correct.**

19. (d)

Explanation:

- **Gold, silver, platinum and copper** are found in the **free state**. Copper and silver are also found in the combined state as their sulphide or oxide ores. **Hence, statement (1) is NOT correct.**
- The **metals with high reactivity such as potassium, sodium, calcium magnesium** and **aluminium** (K, Na, Ca, Mg and Al) are so reactive that they are never found in nature as free elements. **Hence, statement (2) is NOT correct.**
- The metals with medium reactivity such as Zinc, Iron, Lead (Zn, Fe, Pb, etc.) are moderately reactive.
- They are found in the earth's crust mainly as oxides, sulphides or carbonates. The ores of many metals are oxides. This is because **oxygen is a very reactive element** and is very abundant on the earth.

20. (a)

Explanation:

- When there is a **short circuit** in an electrical circuit, it is **like a superhighway for electricity.** Instead of flowing through its usual path with some resistance (like normal roads), the electricity takes a shortcut with almost no resistance at all.
- Imagine water flowing in a hose. Normally, the hose has some resistance, and the water flows at a certain speed. But if you suddenly remove all the obstacles and let the water flow without any resistance, it will gush out fast.
- In the same way, **during a short circuit, the electricity flows super-fast** because there's almost no resistance. So, the **current in the circuit increases heavily.** This can be dangerous because it can cause overheating and damage to the wires and devices in the circuit. That's why short circuits need to be fixed or protected against. **Hence, option (a) is correct.**

21. (b)

Explanation:

- **Total internal reflection** is a phenomenon that occurs when **light travelling from a denser medium to a less dense medium reflects into the denser medium** if the angle of incidence is greater than the critical angle.
- **• Applications of total internal reflection (TIR):**
  - **Mirage:** In this, light from a distant object is refracted as it passes through layers of air with different densities, leading to an apparent but unreachable image of the object.
  - **Fiber optics communication:** In this, the light signals within the fiber are repeatedly reflected off the inner surface due to total internal reflection, allowing for efficient transmission of data over long distances.
  - Since, only Mirage and Fiber optics communication are covered by Total internal reflection. **Hence, option (b) is correct.**
- On the other hand, total internal reflection occurs only when a ray of light travel from denser medium to rarer medium. So, if **light is travelling from water to glass, no total internal reflection will be possible.**
- Further, **dispersion of light is a phenomenon on its own.** It happens when white light is passed through a glass prism it splits into its spectrum of colours.

22. (c)

Explanation:

- **Both plant and animal cells are eukaryotic** and contain a **nucleus,** which is a membrane-bound organelle that houses the genetic material (DNA). **Hence, statement (1) is correct.**

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- **Plant cells have a rigid cell wall** made of cellulose, which provides structural support. In contrast, animal cells do not have a cell wall; instead, they are surrounded by a flexible cell membrane. **Hence, statement (2) is correct.**
- **Mitochondria,** which are responsible for **energy production** through cellular respiration, are found in both plant and animal cells. **Hence, statement (3) is correct.**
- In general, **plant cells often have a large central vacuole** that can be larger and more prominent than the smaller vacuoles found in animal cells. So, it's the opposite of what the statement suggests. **Hence, statement (4) is NOT correct.**

23. (d)

Explanation:

- The **cornea in Human eye is not responsible for colour vision.** It mainly helps in focusing light onto the retina and protecting the eye. The **retina contains photoreceptor cells** called rods, which are responsible for night vision and cones, which are **responsible for colour vision. Hence, statement (1) is NOT correct.**
- The **size of the pupil does change in response to varying light conditions.** The pupil's diameter can be adjusted by the muscles in the iris to control the amount of light entering the eye.
- In bright light, the iris contracts, making the pupil smaller (constriction), reducing the amount of light entering the eye.
- This adjustment helps to regulate the amount of light reaching the retina to ensure optimal vision under different lighting conditions. **Hence, statement (2) is NOT correct.**

24. (c)

Explanation:

- **Magnetic field lines indeed emerge from the south pole** and converge towards the north pole of a magnet. Magnetic field lines represent the path along which a north magnetic pole would move when placed in the magnetic field.
- They **form closed loops,** and this pattern is consistent with the behaviour of magnets. **Hence, statement (1) is correct.**
- **Magnetic field lines always form closed loops,** meaning they do not have a beginning or end. They continuously flow from the north pole of a magnet to the south pole, forming a closed path. There are no isolated magnetic monopoles (single magnetic poles) in nature. **Hence, statement (2) is correct.**
- The Earth's magnetic field is primarily generated by the movement of molten iron in its outer core. **The motion of molten iron generates electric currents** through a process known as the **Geodynamo theory.** These electric currents, in turn, produce the Earth's magnetic field. **Hence, statement (3) is correct.**

25. (b)

Explanation:

- **Rear-view mirror:** Rear-view mirrors in vehicles typically use a **convex mirror.** This mirror bulges outward which provides a wider field of view. It helps reduce blind spots for drivers by providing a larger area for reflection.
- **Magnifying glass:** A **magnifying glass or a simple magnifier** typically **uses a convex lens** to magnify objects. A convex lens is thicker in the canter than at the edges, and it converges light rays, creating a magnified virtual image when an object is placed within its focal length.
- **Prism:** Prisms are **solid optical elements** made of transparent material, such as glass or plastic. They can refract (bend) light as it passes through them, causing it to disperse into its component colours or change direction. **Prisms do not involve the use of convex lenses.**
- **Myopic lens:** A **myopic (near-sighted) corrective lens** is typically a **concave lens, not a convex lens.** Concave lenses are thinner in the centre than at the edges and diverge light rays. They are used to correct near-sightedness by helping to focus distant objects onto the retina properly.

Hence, option (b) is correct.

26. (d)

Explanation:

- The **green plants in a terrestrial ecosystem** capture **about 1% of the energy of sunlight** that falls on their leaves and convert it into food energy. **Hence, statement (1) is NOT correct.**

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- When green plants are eaten by primary consumers, a great deal of energy is lost as heat to the environment, some amount goes into digestion and in doing work and the rest goes towards growth and reproduction.
- An **average of 10%** of the food eaten is turned into its own body and made available for the next level of consumers. Therefore, 10% can be taken as the average value for organic matter that is present at each step and reaches the next level of consumers.
- Since **very little energy is available for the next level of consumers, food chains** generally consist of only three or four steps. **The loss of energy at each step is so great that very little usable energy remains after four trophic levels. Hence, statement (2) is NOT correct.**
- **There are generally a greater number of individuals at the lower trophic levels of an ecosystem. The greatest number is of the producers.**

27. (d)

Explanation:

- The **four fundamental forces of nature are-** Gravitational Force, Weak Nuclear Force, Electromagnetic Force and Strong Nuclear Force.
- The **fundamental force** responsible for **holding the nucleus of an atom together** is the **strong nuclear force. Hence, option (d) is correct.**
- The strong nuclear force is the strongest of the fundamental forces. **It is about 100 times stronger than electromagnetism and 100 trillion trillion trillion times stronger than gravity.**
- **The nucleus,** which contains protons and neutrons, is held together by this powerful force, which overcomes the electromagnetic repulsion between positively charged protons.
- The electromagnetic force and gravitational force do not play significant roles in holding the nucleus together.
- The **weak nuclear force is responsible for certain types of nuclear reactions,** such as beta decay, but it is not the force that binds the nucleus together.

28. (d)

Explanation:

- e-NAM was launched in **2016** as a **pan-India electronic trade portal** linking **Agricultural Produce Market Committees (APMCs)** across the States. **Hence, statement (1) is correct.**
- It provides for contactless remote bidding and mobile-based anytime payment for which traders do not need to either visit mandis or banks for the same. **Hence, statement (4) is correct.**
- Already 585 mandis in 16 States and 2 Union Territories have been integrated on e-NAM portal and will be soon expanded to cover an additional 415 mandis, which will take the total number of e-NAM mandis to 1,000.
- e-NAM is set to cross 1 trillion Rupees trade in FY24.
- It creates a unified national market for agricultural commodities by:
  - Streamlining of procedures across the integrated markets.
  - Removing information asymmetry between buyers and sellers.
  - Promoting real-time price discovery.
- It is completely funded by the Central Government. **Hence, statement (2) is correct.**
- It is implemented by the **Small Farmers Agribusiness Consortium, under the Ministry of Agriculture and Farmers' Welfare**. **Hence, statement (3) is correct.**

29. (c)

Explanation:

- **Ministry of Agriculture & Farmers Welfare (MoA&FW) launched PM-Kisan Mobile App with Face Authentication Feature. Hence, statement (1) is correct.**
- PM- KISAN scheme has become **the first scheme of government to do e-KYC through facial authentication** mobile app.
- App will enable farmers to complete their e-KYC process by scanning their face on mobile phones instead of using OTPs or fingerprints. **Hence, statement (2) is correct.**
- App **resolve difficulties related to Aadhaar verification and updating bank account details on PM Kisan Portal through effective use of digital public goods.**
- Face Authentication Process is used to uniquely identify a person based on facial features like distance between eyes, shape of cheekbones etc.
- **It is a part of a larger biometric security tool which includes iris scan, fingerprints etc.**

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30. (d)

Explanation:

- **The idea of a smart city makes use of computer and communication technology along with Internet of Things (IoT), Web of Things (WoT) to manage and distribute resources efficiently.**
- Every sphere of life in a city like transportation systems, schools, libraries etc. work in unison to optimise the efficiency of city operations and services.
- In an IoT enabled smart school, following can be available-
  - **Smart Boards:** These boards can communicate with other devices and the internet to enhance teaching and learning.
  - **Online Tests:** The IoT can facilitate online testing and assessment by connecting students' devices to a centralized testing platform. This allows for real-time monitoring and automated grading.
  - **WiFi Sensors on Classroom Doors:** IoT-enabled sensors on classroom doors can monitor entry and exit, helping to track attendance, enhance security, and optimize energy use within the school building.
  - **Sensors in Buses to Monitor their Location:** IoT sensors in school buses can provide real-time tracking of the buses' locations. This not only ensures the safety of students during transportation but also allows for better route optimization and management.
  - **Wearables for Attendance Monitoring:** Wearables such as smartwatches or smart belts can be used for attendance monitoring. Students can wear these devices, and their attendance can be automatically recorded using IoT technology.

Hence, option (d) is correct.

31. (c)

Explanation:

- The Indian Astronomical Observatory (IAO) in Ladakh successfully documented the occurrence of a rare Aurora phenomenon for the very first time.
- IAO is situated above Mount Saraswati in the Hanle Valley of Changthang, Ladakh, at nearly 14,800 feet above sea level.
- Auroras are **geomagnetic storms** which are seen due to an intense interaction of the **sun's plasma waves and the earth's magnetic field. Hence, statement (1) is correct.**
- During a coronal mass ejection, billions of charged particles move into space at ultra-high speeds, some reaching up to 3 million kilometres per hour. When they arrive in the direction of Earth, they cause a disturbance in the Earth's magnetic field and enable us to see the aurora lights.
- The shape of Earth's magnetic field creates **two auroral ovals above the North and South Magnetic Poles. Hence, statement (2) is correct.**
- It is called an **aurora borealis or northern light near the North pole** and **aurora australis** or the southern lights near the South pole.
- They are more frequent at **higher latitudes** and places like Alaska, Canada, and Antarctica, closer to the Earth's poles. **Hence, statement (3) is correct.**
- However, due to a geo-effective **coronal mass ejection** (CME), the Northern Lights were observed at unprecedented **mid-to-low latitudes** across the United States, brightly lit European cities, and even over China and India.

32. (a)

Explanation:

- As the year **2024 marks the centenary of the Vaikom Satyagraha**, **Chief Minister of Kerala and Tamil Nadu jointly inaugurated its centenary celebrations.**
- The princely state of Travancore had a feudal, militaristic, and ruthless system of custom-ridden government, some of the most rigid, refined and ruthless social norms and customs were seen in Travancore.
- **Lower castes like the Ezhavas and Pulayas were considered polluting and various rules were in place to distance them from upper castes.**
- These included a **prohibition, not just on temple entry, but even on walking on the roads surrounding temples.**
- In 1923, Madhavan presented the issue as a resolution at the Kakinada meet of All India Congress Committee.
- Subsequently, it was taken up by the Congress Untouchability Committee formed by the Kerala Pradesh Congress Committee in January 1924.
- **Madhavan, K.P. Kesava Menon who was the then secretary of Kerala Pradesh Congress Committee and Congress leader and educationist K. Kelappan (also known as Kerala Gandhi) are considered the pioneers of the Vaikom Satyagraha movement. Hence, statement (1) is correct.**

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- **For the first time, it brought Gandhian methods of nonviolent protest to Travancore. Hence, statement (2) is correct.**
- The movement continued for over 600 days, nonstop, through social pressure, police crackdowns and even natural disaster in 1924, is admirable.
- **In 1936, the historic Temple Entry Proclamation was signed by the Maharaja of Travancore which removed the age-old ban on the entry of temples. Hence, statement (3) is NOT correct.**

33. (b)

Explanation:

- **India** is currently home to **40 UNESCO World Heritage Sites,** making it the country with the **sixth-largest** number of sites in the world.
- Out of these, **32 are cultural sites, 7 are natural sites,** and **one is a mixed-type site,** the **Khangchendzonga National Park (Sikkim). Hence, statement (1) is NOT correct.**
- The **cultural heritage sites** in India include ancient temples, forts, palaces, mosques, and archaeological sites that reflect the rich history and diversity of the country.
- The **natural heritage sites** in India include national parks, wildlife reserves, and natural landscapes that showcase the country's unique biodiversity and ecological significance.
- The **mixed-type site in India, the Khangchendzonga National Park, is known for its cultural significance as well as its biodiversity,** as it is home to several rare and endangered species.
- **Article 49 of the Directive Principles of State Policy** puts obligation on the State to protect every monument or place or object of artistic or historic interest, declared by or under law made by Parliament to be of national importance**. Hence, statement (2) is correct.**
- **Fundamental Duty: Article 51A** of Constitution states that it shall be the duty of every citizen of India to value and preserve the rich heritage of our culture.
- **Ancient Monuments and Archaeological Sites and Remains Act (AMASR Act) 1958:** It is an act of the Parliament of India that provides for the preservation of ancient and historical monuments and archaeological sites and remains of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.

34. (d)

Explanation:

- **Recently, the United Nations Population Fund (UNFPA) has released the State of World Population report 2023. Hence, statement (1) is correct.**
- It states that India will overtake China to become the world's most populous country by the middle of 2023.
- The State of World Population is **published annually** which covers and analyses developments and trends in world population and demographics, as well as shedding light on specific regions, countries and population groups and the unique challenges they face.
- **It is a subsidiary organ of the UN General Assembly and works as a sexual and reproductive health agency. Hence, statements (3) and (4) are correct.**
- The UN Economic and Social Council (ECOSOC) establishes its mandate.
- It was established as a trust fund in 1967 and began operations in 1969.
- UNFPA works directly to tackle Sustainable Development Goals on health (SDG3), education (SDG4) and gender equality (SDG5).
- **UNFPA is not supported by the UN budget, instead, it is entirely supported by voluntary contributions** of donor governments, intergovernmental organizations, the private sector, foundations and individuals. **Hence, statement (2) is NOT correct.**

35. (a)

Explanation:

- **Earth Hour is a worldwide movement** organised to encourage individuals, communities and businesses to **turn off non-essential electric lights for one hour.**
- It is **organised on the last Saturday of March** as a symbol of commitment to the planet.
- **Earth Hour is the World Wildlife Fund for Nature (WWF)'s annual initiative that began in 2007. Hence, statement (1) is correct.**
- It encourages people from more than 180 countries to switch off the lights from 8.30 pm to 9.30 pm as per their local time.
- **Earth Overshoot Day is the annual campaign of Global Footprint Network. Hence, statement (2) is NOT correct.**

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- **Global Footprint Network** is an international **nonprofit organization** which works to **help end ecological overshoot** by making ecological limits central to decision-making.
- It marks the date when humanity has exhausted nature's budget for the entire year. Hence, it varies every year.
- Earth Overshoot Day of 2023 falls on August 2.
- For the rest of the year, we are maintaining our ecological deficit by drawing down local resource stocks and accumulating carbon dioxide in the atmosphere.

36. (a)

Explanation:

Coco Islands:

- **They are in the north-eastern Bay of Bengal. Hence, pair (1) is correctly matched.**
- They are part of the Yangon region of Myanmar.
- These islands are situated very close to the Andaman and Nicobar Islands.

Senkaku Islands:

- **It is the territorial dispute over a group of uninhabited islands in the East China Sea (Pacific Ocean). Hence, pair (2) is NOT correctly matched.**
- These are- Senkaku Islands in Japan, Diaoyu Islands in China, and Tiaoyutai Islands in Taiwan.
- Both Japan and China claim ownership of these islands.

Reunion Islands:

- **It is the French overseas department and overseas region in the western Indian Ocean. Hence, pair (3) is NOT correctly matched.**
- It is located east of Madagascar and southwest of Mauritius.

37. (c)

Explanation:

- **Fructose** is an important ketohexose. It is obtained along with glucose by the hydrolysis of disaccharide, sucrose. It is a **natural monosaccharide** found in **fruits, honey and vegetables.** In its pure form it is used as a **sweetner.** It is also an important ketohexose.
- **Lactose:** It is more commonly known as **milk sugar** since this disaccharide is found in milk. **Hence, pair (1) is correctly matched.**
- **Sucrose** is the scientific name for **table sugar.**
  - Sucrose is a disaccharide consisting of one glucose molecule and one fructose molecule, or 50% glucose and 50% fructose.
  - It's a naturally occurring carbohydrate found in many **fruits, vegetables, and grains,** but it's also added to **many processed foods,** such as candy, ice cream, breakfast cereals, canned foods, soda, and other sweetened beverages.
  - Table sugar and the sucrose found in processed foods are commonly extracted from **sugar cane or sugar beets.**
  - Sucrose tastes **less sweet** than fructose alone but sweeter than glucose alone. **Hence, pair (2) is correctly matched.**
- When long chains of sugars, such as starches, are broken down in the gastrointestinal tract, smaller sugars, including maltose, are produced. **Maltose** is considered a disaccharide — it's actually made of two smaller glucose sugars.
- **Maltose,** like fructose and lactose, is considered a simple sugar. And as for the food and drink sources of maltose, it's found in **breads and cereals,** is an important component in **brewing beer and distilling alcohol** and provides a distinct flavor to malted beverages. **Hence, pair (3) is correctly matched.**

38. (a)

Explanation:

- It has been observed that certain **organic compounds are required in small amounts** in our diet but their deficiency causes specific diseases. These compounds are called **vitamins.**
- Most of the vitamins cannot be synthesised in our body but plants can synthesise almost all of them. However, **the bacteria of the gut can produce some of the vitamins required by us.**
- The term "Vitamine" was coined from the word vital + amine since the earlier identified compounds had amino groups. **Later work showed that most of them did not contain amino groups,** so the letter 'e' was dropped, and the term vitamin is used these days. **Hence, statement (3) is NOT correct.**
- Vitamins are classified into two groups depending upon their solubility in water or fat.
  - **Fat soluble vitamins:** Vitamins which are soluble in fat and oils but insoluble in water are kept in this group. These are vitamins A, D, E and K. They are stored in liver and adipose (fat storing) tissues.

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- **Water soluble vitamins:** B group vitamins and vitamin C are soluble in water so they are grouped together. Water soluble vitamins must be supplied regularly in diet because they are readily excreted in urine and cannot be stored (except vitamin B12) in our body.
- B12 is stored as mitochondrial 5-deoxyadenosylcobalamin, **primarily in the liver** (2 to 5 mg) but **also about another 1/3rd in muscle. Hence, statement (1) is NOT correct.**

- Vitamin D2 is naturally found in mushrooms, including shiitake, Portobello, and crimini mushrooms. The vitamin D content increases when these mushrooms are exposed to UV radiation.
- Vitamin D3 is naturally found in animals and animal-derived products like milk. It is also directly synthesized in the skin when it is exposed to ultraviolet B (UVB) radiation. **Hence, statement (2) is correct.**
- Humans are able to synthesize certain vitamins to some extent. For example, **vitamin D is produced when the skin is exposed to sunlight;** VitaminB3 niacin can be synthesized from the amino acid tryptophan; and vitamin K and biotin are synthesized by bacteria living in the gut.

39. (b)

Explanation:

- **DNA Fingerprinting** is known that **every individual has unique fingerprints. Hence, statement (1) is correct.**
- These occur at the tips of the fingers and have been used for identification for a long time but **these can be altered by surgery. Hence, statement (2) is correct.**
- **A sequence of bases on DNA is also unique for a person** and information regarding this is called DNA fingerprinting. **Hence, statement (3) is NOT correct.**
- It is **same for every cell and cannot be altered** by any known treatment. **Hence, statement (4) is NOT correct.**
- DNA fingerprinting is now used
  - in forensic laboratories for identification of criminals.
  - to determine paternity of an individual.
  - to identify the dead bodies in any accident by comparing the DNA's of parents or children.
  - to identify racial groups to rewrite biological evolution.

40. (b)

Explanation:

- **Deoxyribonucleic acid (DNA)** is the chemical basis of heredity and may be regarded **as the reserve of genetic information.** DNA is exclusively responsible for maintaining the identity of different species of organisms over millions of years. A DNA molecule is capable of self duplication during cell division and identical DNA strands are transferred to daughter cells
- The **proteins are synthesised by various RNA** molecules in the cell but the **message for the synthesis of a particular protein is present in DNA.**
- **Ribonucleic acid (RNA)** is typically single stranded and contains ribose as its pentose sugar and the pyrimidine uracil instead of thymine.
- Although RNA does not serve as the hereditary information in most cells, **RNA does hold this function for many viruses that do not contain DNA.**
- If **DNA serves as the complete library of cellular information,** mRNA serves as a photocopy of specific information needed at a particular point in time that serves as the instructions to make a protein.
- There are three main types of RNA, all involved in protein synthesis.
  - Messenger RNA **(mRNA)** serves as the intermediary between DNA and the synthesis of protein products during translation.
  - Ribosomal RNA **(rRNA)** is a type of **stable RNA** that is a major constituent of ribosomes. It ensures the proper alignment of the mRNA and the ribosomes **during protein synthesis** and catalyzes the formation of the peptide bonds between two aligned amino acids during protein synthesis.
  - Transfer RNA **(tRNA)** is a small type of stable RNA that carries an amino acid to the corresponding site of protein synthesis in the ribosome
- Although RNA is **not used for long-term genetic information** in cells, many **viruses do use RNA as their genetic material.**

Hence, Both Statement-I and Statement-II are correct and Statement-II is NOT the correct explanation for Statement-I.

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41. (d)

Explanation:

- **Rubber** is a **natural polymer** and possesses **elastic properties.** It is also termed as elastomeric polymer. In elastomeric polymers, the polymer chains are held together by **the weak intermolecular forces.**
- These weak binding forces permit the polymer to be stretched. A few **'crosslinks'** are introduced in between the chains, which help the polymer to retract to its original position after the force is released.
- Rubber has a variety of uses. It is manufactured from **rubber latex** which is a colloidal dispersion of rubber in water. This latex is obtained from the rubber tree which is found in **India, Srilanka, Indonesia, Malaysia and South America.**
- **Natural rubber** may be considered as a linear polymer of **isoprene** (2-methyl-1, 3-butadiene) and is also called as cis - 1, 4 - polyisoprene. **Hence, statement (2) is NOT correct.**
- In view of the potential environmental hazards of synthetic polymeric wastes, certain **biodegradable polymers** such as **Poly β-hydroxybutyrate – co-β-hydroxy valerate (PHBV) and Nylon-2- Nylon-6** are developed as alternatives. **Hence, statement (1) is NOT correct.**

42. (b)

Explanation:

- A major breakthrough in the treatment of **hyperacidity** came through the discovery according to which a chemical, **histamine,** stimulates the **secretion of pepsin and hydrochloric acid** in the stomach.
- The drug **cimetidine** (Tegamet), was designed to prevent the interaction of histamine with the receptors present in the stomach wall. This resulted in release of lesser amount of acid. The importance of the drug was so much that it remained the largest selling drug in the world until another drug, **ranitidine (Zantac),** was discovered. **Hence, pair (1) is correctly matched.**
- **Antidepressant drugs** inhibit the enzymes which catalyse the degradation of **noradrenaline. Iproniazid and phenelzine** are two such drugs.
- Some tranquilizers namely, **chlordiazepoxide and meprobamate,** are relatively mild tranquilizers suitable for relieving tension**. Equanil** is used in controlling depression and hypertension. **Hence, pair (2) is NOT correctly matched.**
- **Analgesics** reduce or abolish pain without causing impairment of consciousness, mental confusion, incoordination or paralysis or some other disturbances of nervous system.
- **Aspirin** and **paracetamol** belong to the class of non-narcotic analgesics. Narcotic analgesics are **morphines, heroin and codeine. Hence, pair (3) is correctly matched.**
- Antiseptics are applied to the living tissues such as wounds, cuts, ulcers and diseased skin surfaces. Examples are **furacine, soframicine**,**tincture of Iodine and Iodoform** etc. These are not ingested like antibiotics. Commonly used antiseptic, **dettol** is a mixture of chloroxylenol and terpineol.
- **H.W. Florey and Alexander Fleming** shared the Nobel prize for Medicine in 1945 for their independent contributions to the development of **antibiotic drug penicillin. Hence, pair (4) is NOT correctly matched.**

43. (b)

Explanation:

- Natural sweeteners, e.g., **sucrose add to calorie intake and therefore many people prefer to use artificial sweeteners. Hence, statement (3) is NOT correct.**
- Ortho-sulphobenzimide, also called **saccharin,** is the first popular artificial sweetening agent. It has been used as a sweetening agent ever since it was discovered in 1879. **It is about 550 times as sweet as cane sugar.** It is excreted from the body in urine unchanged. It appears to be entirely inert and harmless when taken. Its use is of great value to diabetic persons and people who need to control intake of calories. **Hence, statement (1) is correct.**
- Aspartame is the most successful and widely used artificial sweetener. It is roughly 100 times as sweet as cane sugar. It is methyl ester of dipeptide formed from aspartic acid and phenylalanine. **Use of aspartame is limited to cold foods and soft drinks because it is unstable at cooking temperature. Hence, statement (2) is correct.**
- **Alitame** is high potency sweetener, although it is more stable than aspartame, the control of sweetness of food is difficult while using it.
- **Sucralose** is trichloro derivative of sucrose. Its appearance and taste are like sugar. It is stable at cooking temperature. It does not provide calories.

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44. (d)

Explanation:

- Synthetic detergents are cleansing agents which have all the properties of soaps, but which actually do not contain any soap.
- These can be used both in soft and hard water as they give foam even in hard water. Some of the detergents give foam even in ice cold water.
- Detergents are **sodium or ammonium salts of amines with acetates, of sulphonated long chain alcohols or hydrocarbons. Hence, statement (1) is NOT correct.**
- Soaps used for cleaning purpose are **sodium or potassium salts of long chain fatty acids,** e.g., stearic, oleic and palmitic acids.
- Soaps containing sodium salts are formed by heating fat (i.e., glyceryl ester of fatty acid) with aqueous sodium hydroxide solution. This reaction is known as **saponification.** Soaps do not work in hard water. **Hence, statement (2) is NOT correct.**

45. (d)

Explanation:

- Dinitrogen and dioxygen are the main constituents of air. These gases do not react with each other at a normal temperature.
- At high altitudes when lightning strikes, they combine to form **oxides of nitrogen.** NO_2 is oxidised to **nitrate ion, NO_3^-** which is washed into soil, where it serves as a fertilizer.
- In an automobile engine, (at high temperature) when fossil fuel is burnt, dinitrogen and dioxygen combine to yield significant quantities of **nitric oxide (NO) and nitrogen dioxide (NO_2).**
- NO_2 is a **brown gas** and at sufficiently high levels can contribute **to haze.**
- The irritant red haze in the traffic and congested places is due to oxides of nitrogen. Higher concentrations of NO_2 damage the leaves of plants and retard the rate of photosynthesis. Nitrogen dioxide is a lung irritant that can lead to an acute respiratory disease in children. It is toxic to living tissues also. Nitrogen dioxide is also harmful to various textile fibres and metals.

Hence, option (d) is correct.

46. (d)

Explanation:

- **Methane** is the primary contributor to the formation of **ground-level ozone,** a **hazardous air pollutant** and **greenhouse gas,** exposure to which causes 1 million premature deaths every year.
- **Methane is also a powerful greenhouse gas.** Methane has a much shorter atmospheric lifetime than carbon dioxide (CO_2) – around **12 years** compared with **centuries** – it is **80 times more potent at warming than carbon dioxide.**
- Methane is produced naturally when **vegetation is burnt,** digested or rotted in the absence of oxygen.
- Large amounts of methane are released in **paddy fields, animal husbandry, coal mines, from rotting garbage dumps and by fossil fuels.**
- Each **termite produces,** on average, about half a microgram of methane per day, a seemingly insignificant amount. However, when this is multiplied up by the world population of termites, global methane emission from this source is estimated to be about 20 million tonnes each year.

Hence, option (d) is correct.

47. (b)

Explanation:

- **Smog:** The word smog is derived from smoke and fog.
- Classical smog occurs in **cool humid climate.** It is a mixture of smoke, fog and **sulphur dioxide.** Chemically it is a reducing mixture and so it is also called as reducing smog.
- Photochemical smog occurs **in warm, dry and sunny climate. Hence, statement (1) is NOT correct.**
- The main components of the photochemical smog result from the action of sunlight on **unsaturated hydrocarbons and nitrogen oxides** produced by automobiles and factories. Photochemical smog has high concentration of oxidising agents and is, therefore, called as oxidising smog.
- The common components of photochemical smog are **ozone, nitric oxide, acrolein, formaldehyde and peroxyacetyl nitrate (PAN). Hence, statement (2) is correct.**

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- Both ozone and PAN act as powerful eye irritants. Ozone and nitric oxide irritate the nose and throat and their high concentration causes headache, chest pain, dryness of the throat, cough and difficulty in breathing.
- Photochemical smog leads to cracking of rubber and extensive damage to plant life. It also causes corrosion of metals, stones, building materials, rubber and painted surfaces.
- Usually **catalytic converters** are used in the automobiles, which prevent the release of nitrogen oxide and hydrocarbons to the atmosphere. **Certain plants e.g., Pinus, Juniparus, Quercus, Pyrus and Vitis can metabolise nitrogen oxide and therefore, their plantation could help in this matter. Hence, statement (3) is correct.**

48. (b)

Explanation:

Section 499 of Indian Penal Code (IPC) States:

- Whoever, by words either spoken or intended to be read, or by signs or by visible representations, makes or publishes any imputation concerning any person intending to harm, or knowing or having reason to believe that such imputation will harm, the reputation of such person, is said, except in the cases hereinafter expected, to defame that person. **Hence, statement (1) is correct.**
- These can either be **published or spoken** about a person with the intention of damaging the reputation of that person, or with the knowledge or reason to believe that the imputation will harm his reputation. **Section 500** stipulates **imprisonment** of **up to two years,** with or without a fine, for someone held guilty of criminal defamation.
- Defamation is the act of communicating false statements about a person that injure the reputation of that person when observed through the eyes of an ordinary man.
- **Article 19** of the Constitution grants freedom of speech to its citizens. However, Article 19(2) has imposed certain **reasonable exemptions** to this freedom such as - Contempt of Court, **defamation** and incitement to an offense. **Hence, statement (2) is correct.**
- In India, **defamation** can **both** be a **civil wrong** and a **criminal offense,** depending on the objective they seek to achieve. **Hence, statement (3) is NOT correct.**
- A Civil Wrong sees a wrong being redressed with **monetary compensation,** while a criminal law seeks to punish a wrongdoer and send a message to others not to commit such acts, with a jail term.
- In a Criminal Offense, defamation has to be established beyond reasonable doubt but in a civil defamation suit, damages can be awarded based on probabilities.

49. (d)

Explanation:

- A **Notified Area Committee** (NAC) is a local urban government or municipal body in India that is responsible for the administration and governance of specific areas that are not yet officially designated as urban areas or municipalities. NACs are often established in areas that are transitioning from rural to urban status. **All members** of the NAC including the chairman are **nominated by** the **state government.**
- **Cantonment Boards** are local self-government bodies in India that administer and manage the **civic** and **municipal affairs** in the **cantonment areas.** Cantonments are military or civilian areas with a significant military presence. It **consists** of **elected** and **nominated members.** Elected members include elected representatives from within the cantonment area. Nominated members may include **military officials, government representatives**, and **experts** in various fields.
- **Port trusts** are established in port areas for two purposes: to manage and protect the ports; and to provide civic amenities. It consists of both **elected** and **nominated members.**
- **Townships** are **established by** large **public enterprises** to provide **civic amenities** to their staff. The enterprise appoints a town administrator to look after the administration of townships. It is an extension of the bureaucratic structure of the enterprise. The township form of urban government has **no elected members. All the members are nominated.**

Hence, option (d) is correct.

50. (b)

Explanation:

Deendayal Antyodaya Yojana-National Rural Livelihood Mission:

- It is a **Centrally Sponsored Programme,** launched by the Ministry of Rural Development in 2011. **Hence, statement (1) is NOT correct.**
- It aims to **eliminate rural poverty** through the **promotion of multiple livelihoods** and **improved access to financial services** for the rural poor households across the country.

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- It involves working with **community institutions** through community professionals in the spirit of self-help which is a unique proposition of it. **Hence, statement (2) is correct.**
- It **impacts livelihoods** by:
  I. Mobilizing rural households into SHGs.
  II. Organizing one-woman member from each rural poor household into SHGs
  III. Providing training and capacity building to SHG members
  IV. Providing access to financial resources from their own institutions and banks.
- It has Sub Programs such as **Mahila Kisan Shashaktikaran Pariyojana**, **Start-Up Village Entrepreneurship Programme, Aajeevika Grameen Express Yojana** etc.
- The NRLM has enabled rural families to negotiate for greater access to essential services such as **education** and **healthcare.** It has **improved food security, improved school enrolment,** access to land for women to grow food, and created an impact on gender issues with women's groups taking on issues like dowry, child marriage, and discrimination against girls.

51. (d)

Explanation:

- Preventive detention means **detention of a person without trial and conviction by a court.** Its purpose is not to punish a person for a past offence but to **prevent him from committing an offence in the near future.**
- The grounds for Preventive detention are **State security, public order, Foreign Affairs, and Community services.**
- **Section 151** of **CrPC** provides that a police officer may arrest a person without any orders from the magistrate and without any warrant, if it appears to him that the commission of the offence cannot be prevented without arrest.
- Article 22 grants protection to persons who are detained under a preventive detention law. This **protection is available** to **both citizens as well as aliens. Hence, statement (1) is NOT correct.**
- Article 22 authorizes the **Parliament** to prescribe the circumstances and the classes of **cases in which a person can be detained for more than three months** under a preventive detention law without obtaining the opinion of the advisory board.
- The detention of a person cannot exceed three months unless an advisory board reports sufficient cause for extended detention. The board is to consist of judges of a high court. **Hence, statement (2) is NOT correct.**
- **Parliament** has the **power to prescribe** the **maximum period for which a person can be detained** in any classes of cases under a preventive detention law. **Hence, statement (3) is NOT correct.**

52. (b)

Explanation:

- The Election Commission of India has recognized the **Aam Aadmi Party** (AAP) as a **national party.** With this decision, AAP joins the Bharatiya Janata Party (BJP), Indian National Congress (INC), Bahujan Samaj Party (BSP), CPI(M), and National People's Party (NPP) as the sixth national party in the country.
- The **Election Commission** of India (ECI) **registers political parties** for the purpose of elections and grants them recognition as national or state parties on the basis of their poll performance.
- The other parties are simply declared as registered-unrecognized parties. As per the **Representation of People Act 1951,** registered political parties, in course of time, can get recognition as 'State Party' or' National Party'.
- A party is recognized as a **national party** if any of the following condition is fulfilled:
  - If it secures **six percent of valid votes** polled in any **four or more states** at general election to the **Lok Sabha** or to the **legislative assembly;** and in addition, it wins **four seats** in the **Lok Sabha** from any states or states.
  - If it wins **two percent of seats** in the **Lok Sabha** at a general election, these candidates are elected from **three states.**
  - If it is recognized as a **state party** in **four states. Hence, statement (1) is correct.**
- There is **no such provision** that for granting recognition as a national party, the party's performance over two consecutive Lok Sabha or assembly elections will be considered. **Hence, statement (2) is NOT correct.**

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53. (b)

Explanation:

- The **Justice Ranganath Mishra Commission for Religious and Linguistic Minorities,** was appointed to examine and make recommendations regarding the socio-economic and educational status of **religious and linguistic minorities** in India.
- The commission was constituted in 2004 and submitted its report in 2007. Its **primary focus** was on the conditions of religious and linguistic minorities, including **Muslims, Christians, Sikhs, Buddhists, and Parsis,** among others.
- The commission aimed to **assess** their **educational** and **economic backwardness** and recommend measures to uplift these communities.
- It **recommended Scheduled Caste** (SC) **reservation for Dalit converts to Christianity and Islam** in **government jobs and educational institutions.**
- The commission's report and its recommendations were important in the context of affirmative action and minority rights in India.

Hence, option (b) is correct.

54. (c)

Explanation:

- The warring sides in **Yemen** swapped hundreds of prisoners - a move which has built hopes for a permanent ceasefire between the Saudi-backed government forces and the Iranian-backed **Houthi rebels.**
- The **Yemeni Civil War** began in **2011** after the ousting of authoritarian president Ali Abdullah Saleh. The new president, Abdrabbuh Mansour Hadi, was unable to stabilize the country due to **economic** and **security problems.** The **Houthis,** a Zaidi **Shia Muslim minority group,** took advantage of this and seized control of the north and the capital, Sanaa in 2014.
- The **Syrian Civil War,** which began in 2011, is a protracted and devastating conflict in the Middle East. It erupted as part of the wider **Arab Spring protests,** with Syrians initially demanding political reforms.
- Multiple factions, including the government led by President Bashar al-Assad, opposition groups, and extremist organizations like **ISIS,** have been engaged in a **complex** and **deadly struggle.**
- The **Libyan Civil War,** which began in 2014, is a complex and ongoing conflict characterized by **power struggles** and **regional divisions.**
- It emerged following the ousting of Muammar Gaddafi in 2011 and escalated into a multifaceted conflict involving multiple **armed groups, political factions,** and **external actors.**
- The conflict's main actors are the UN-recognized Government of National Accord (GNA) and the self-styled Libyan National Army (LNA) led by General Khalifa Haftar. Various international players have supported different sides, intensifying the conflict. The war has resulted in widespread instability, humanitarian crises, and displacement.

Hence, option (c) is correct.

55. (c)

Explanation:

- Iran, an Islamic state between the Caspian Sea in the north and the Persian Gulf in the south. The country is officially named the *Islamic Republic of Iran*.
- Iran borders **Afghanistan, Armenia, Azerbaijan, Iraq, Pakistan, Türkiye and Turkmenistan.** It shares **maritime borders** with **Bahrain, Kuwait, Oman, Saudi Arabia,** and the **United Arab Emirates. Hence, option (c) is correct.**
- With an area of 1,648,195 km², Iran is almost three times the size of France or somewhat smaller than the US state of Alaska.
- Large parts of the country occupy the Iranian Plateau (or Persian Plateau, a geological formation in Western and Central Asia). A broad portion of Iran's coastal regions at the Persian Gulf is part of the Arabian plate.

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56. (b)

Explanation:

- **Finland** has officially **joined NATO** after its application was ratified. Finland has joined NATO due to Russia's invasion of Ukraine, which has made its smaller neighbours feel the need for the powerful military backing that NATO provides.
- The **North Atlantic Treaty Organization** is a **political and military alliance** consisting of 31 member countries. It was formed in 1949 to promote **mutual defence** and **collective security** among its members. **Hence, statement (1) is correct.**
- In 1949, there were **12 founding members** of the Alliance: Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom and the United States.
- Since then, 19 more countries have joined the Alliance: Greece and Turkey (1952); Germany (1955); Spain (1982); Czechia, Hungary and Poland (1999); Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia and

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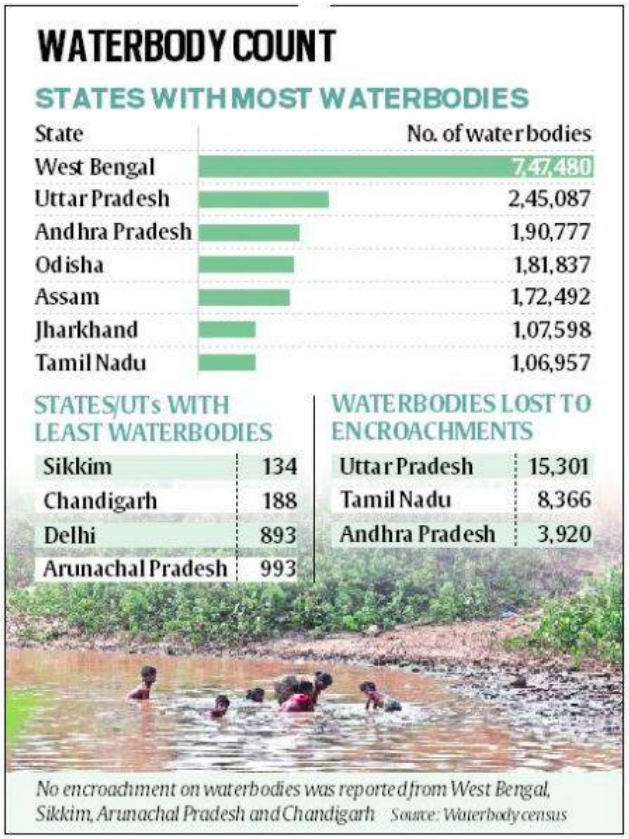
Slovenia (2004); Albania and Croatia (2009); Montenegro (2017); North Macedonia (2020); and Finland (2023).

- **Headquarters: Brussels, Belgium.** Headquarters of Allied Command Operations: Mons, Belgium
- **Article 5:** Article 5 of the NATO treaty is a key provision that states that **an attack on one member is an attack on all members. Hence, statement (2) is correct.**
- This provision has only been invoked once, after the 9/11 terrorist attacks in the United States. However, NATO's protection **does not extend to members' civil wars** or **internal coups. Hence, statement (3) is NOT correct.**
- **Alliances of NATO:** Euro-Atlantic Partnership Council (EAPC), Mediterranean Dialogue, Istanbul Cooperation Initiative (ICI).

57. (d)

Explanation:

- The **Ministry of Jal Shakti** recently released the report of its **first-ever census of water bodies,** revealing crucial insights into the country's water resources. **Hence, statement (1) is NOT correct.**
- The census provides an extensive inventory of water sources in India, highlighting disparities between rural and urban areas and varying levels of encroachment.
- • The census enumerated a **total of 24,24,540 water bodies across the country**, with **West Bengal accounting for the most** (7.47 lakh) and **Sikkim the least** (134). **Hence, statement (2) is NOT correct.**
- West Bengal has the highest number of ponds and reservoirs. The **top district in terms of water bodies is South 24 Parganas in West Bengal.**
- Andhra Pradesh has the highest number of tanks. Tamil Nadu has the highest number of lakes. Maharashtra leads in water conservation schemes.
- The report highlights that **97.1% of the water bodies are in rural areas**, with **only 2.9% in urban areas. Hence, statement (3) is NOT correct.**
- Most of the water bodies are ponds, followed by tanks, reservoirs, water conservation schemes, percolation tanks, check dams, lakes, and others.



58. (a)

Explanation:

- **Heatwaves are prolonged periods of excessively hot weather** that can cause adverse impacts on human health, the environment, and the economy.
- India, being a tropical country, is particularly vulnerable to heatwaves, which have become more frequent and intense in recent years.
- Heat wave is considered if the **maximum temperature of a station** reaches at least **40°C** or more for **Plains** and at least **30°C** or more for **Hilly regions. Hence, statement (1) is correct.**
- **Based on Departure from Normal Heat Wave:** Departure from normal is 4.50°C to 6.40°C. Severe Heat Wave: Departure from normal is >6.40°C.
- **Based on Actual Maximum Temperature Heat Wave:** When actual maximum temperature ≥45°C. Severe Heat Wave: When actual maximum temperature ≥47°C.
- If the above criteria are met in at least 2 stations in a Meteorological subdivision for at least two consecutive days, it is declared so on the second day.

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- High temperature is not fatal but the combination of high temperature and high humidity, referred to as the **wet bulb temperature,** is what makes heat waves deadly. **Hence, statement (2) is NOT correct.**

59. (d)

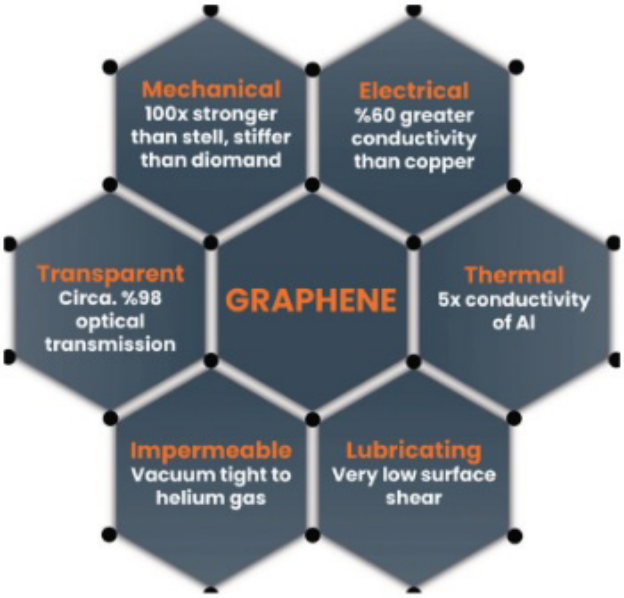
Explanation:

- **5th cycle of India's Tiger Census 2022** revealed that there has been a **6.7%** increase in the Tiger population in the past four years. Tiger census is **conducted every after every 4 years. Hence, statement (1) is NOT correct.**
- The tiger census **covered forested habitats in 20 states of India.** Camera traps were set up at 32,588 locations and generated 47,081,881 photographs. **Hence, statement (3) is NOT correct.**
- **Growth Rate of Tigers:** The growth rate slowed to 6.7% in the four years from 2018 to 2022, from around 33% during 2014-2018.
- **Increase in numbers:** There has been a significant increase in the tiger population in the Shivalik Hills and Gangetic Plains, while tiger occupancy in Jharkhand, Odisha, Chhattisgarh, and Telangana showed a decline.
- The Northeast Hills and Brahmaputra Plains had 194 tigers captured by camera traps, and the region's **Nilgiri cluster is the largest tiger population in the world,** contributing significantly to colonisation of tigers in neighbouring areas.
- **Decline in Tiger population:** Tiger occupancy in the **Western Ghats declined,** the latest analysis showed. Significant declines were observed in the Wayanad landscape and in the Biligiriranga Hills. **Hence, statement (2) is NOT correct.**

60. (c)

Explanation:

- **Graphene is a one-atom-thick layer of carbon atoms** arranged in a **hexagonal lattice.** It is the building-block of Graphite. **Hence, statement (1) is correct.**
- It is the thinnest, most electrically and thermally conductive material in the world, while also being flexible, transparent and incredibly strong. As per estimates, Graphene is more than forty times stronger than diamond. **Hence, statement (2) is correct.**
- It is also **known as a wonder material** due to its vast potential in the energy and medical world. **Hence, statement (3) is correct.**
- Graphene has a lot of promise for additional applications: anti-corrosion coatings and paints, efficient and precise sensors, faster and efficient electronics, flexible displays, efficient solar panels, faster DNA sequencing, drug delivery, and more.



61. (a)

Explanation:

- The **world-famous 'Basholi Painting',** popular for its miniature art style from Kathua district, **Jammu & Kashmir** has obtained the Geographical Indication **(GI) tag.** This is the first time that the Jammu region got a GI tag for handicrafts. **Hence, pair (1) is NOT correctly matched.**
- **Madhya Pradesh's traditional Gond painting** has been awarded the Geographical Indication **(GI) tag,** a recognition that will help protect the art form and the artists who create it. The paintings, which are created by the Gond tribe, depict nature, animals, and religious themes, and showcase their way of life. **Hence, pair (2) is correctly matched.**
- **Kangra painting is the pictorial art of Kangra,** named after Kangra, **Himachal Pradesh,** a former princely state, which patronized the art. **Hence, pair (3) is NOT correctly matched.**
- It became prevalent with the fading of Basholi school of painting in mid-18th century, and soon produced such

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a magnitude in paintings both in content as well as volume, that the Pahari painting school, came to be known as Kangra paintings.

62. (b)

Explanation:

- **The phenomenon of change of liquid into vapours at any temperature below its boiling point is called evaporation.**
- **As per World Economic Forum,** rising global temperatures as a result of climate change are causing water to evaporate faster. It contributes to intensification of drought and reduced fresh water availability. **Hence, option (b) is correct.**
- This is accelerating the water cycle, which could have a significant impact on our seas and on the continent, according to new research.
- Fresh ocean water is becoming fresher, salty ocean water saltier, experts say.
- **A faster water cycle increases the likelihood of extreme weather events and contributes to the melting of polar ice.**
- Climate models have predicted that the water cycle could intensify by as much as seven percent for every degree Celsius of global warming, which means that wet areas would get seven percent wetter and dry areas seven percent drier.

63. (a)

Explanation:

- Using biological waste material is a way of recycling farm waste.
- Based on the kind of biological material used, manure can be classified as:
- **Compost: The process in which farm waste material like livestock excreta** (cow dung, etc.), vegetable waste, animal refuse, domestic waste, sewage waste, straw, eradicated weeds etc. is decomposed in pits is known as composting. The compost is rich in organic matter and nutrients. **Hence, statement (1) is correct.**
- **Vermi-compost:** Compost is also prepared by using earthworms to hasten the process of decomposition of plant and animal refuse. This is called vermi-compost.
- **Green manure:** Prior to the sowing of the crop seeds, **some plants like sun hemp or guar are grown and then mulched by ploughing them into the soil. These green plants thus turn into green manure which helps in enriching the soil in nitrogen and phosphorus. Hence, statement (2) is NOT correct.**

64. (a)

Explanation:

- **Gravitational waves are 'ripples' in space-time caused by some of the most violent and energetic processes in the Universe. Hence, statement (1) is correct.**
- Albert Einstein predicted the existence of gravitational waves in 1916 in his general theory of relativity.
- These cosmic ripples would travel at the speed of light, carrying with them information about their origins, as well as clues to the nature of gravity itself.
- **The strongest gravitational waves are produced by cataclysmic events such as colliding black holes,** supernovae (massive stars exploding at the end of their lifetimes), and colliding neutron stars. **Hence, statement (2) is NOT correct.**
- Other gravitational waves are predicted to be caused by the rotation of neutron stars that are not perfect spheres, and possibly even the remnants of gravitational radiation created by the Big Bang.
- The world's largest gravitational wave observatory and a marvel of precision engineering is **LIGO stands for "Laser Interferometer Gravitational-wave Observatory".**

65. (b)

Explanation:

- **Archimedes' Principle:** When a body is immersed fully or partially in a fluid, it experiences an upward force that is equal to the weight of the fluid displaced by it.

Applications:

- It is **used in designing ships and submarines.**
- **Lactometers, which are used to determine the purity of a sample of milk and hydrometers used for determining density of liquids, are based on this principle.**
- **Thermometers** work on the principle of **thermal expansion of liquids.** Heat sensitive liquids are used in the working of liquid thermometer.
- Modern digital **odometers use a computer chip** to track mileage. They make use of a magnetic or optical sensor that tracks pulses of a wheel that connects to a vehicle's tires.

Hence, option (b) is correct.

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66. (c)

Explanation:

- **Ultrasounds are high frequency waves. Ultrasounds are able to travel along well-defined paths even in the presence of obstacles.**
- Ultrasounds are used extensively in industries and for medical purposes.
- **Ultrasounds can be used to detect cracks and flaws in metal blocks, in construction of big structures like buildings, bridges, machines and also scientific equipment.**
- Ultrasonic waves are made to reflect from various parts of the heart and form the image of the heart. This technique is called **'echocardiography'.**
- Ultrasound scanner is an instrument which uses ultrasonic waves for getting images of internal organs of the human body.
- It helps the doctor to detect abnormalities, such as stones in the gall bladder and kidney or tumours in different organs.
- Ultrasonography is also used for **examination of the foetus during pregnancy to detect congenital defects and growth abnormalities.**
- **Ultrasound may be employed to break small 'stones' formed in the kidneys into fine grains.** These grains later get flushed out with urine.
- Smelting is a process by which a metal is obtained, either as the element or as a simple compound, from its ore by heating beyond the melting point, ordinarily in the presence of oxidizing agents, such as air, or reducing agents, such as coke.

Hence, option (c) is correct.

67. (a)

Explanation:

- Commonly known as **Assisted Reproductive Technologies (ART), In vitro fertilisation** (IVF– fertilisation outside the body in almost similar conditions as that in the body) followed by embryo transfer (ET) **is one of such methods.**
- **In this method, popularly known as test tube baby programme, ova from the wife/donor (female) and sperms from the husband/donor (male) are collected and are induced to form zygote under simulated conditions in the laboratory. Hence, statement (1) is correct.**
- The zygote or early embryos could then be transferred into the fallopian tube (ZIFT–zygote intra fallopian transfer) and embryos, into the uterus (IUT – intra uterine transfer), to complete its further development.
- **One full cycle of IVF takes about 2 to 3 weeks. Hence, statement (2) is NOT correct.**
- Intra cytoplasmic sperm injection (ICSI) is another specialised procedure to form an embryo in the laboratory in which a sperm is directly injected into the ovum.
- Though options are many, all these techniques require extremely high precision handling by specialised professionals and expensive instrumentation.

68. (a)

Explanation:

Haemophilia:

- This sex-linked recessive disease shows its transmission from unaffected carrier female to some of the male progeny.
- **In this disease, the clotting of blood is affected. Due to this, in an affected individual a simple cut will result in non-stop bleeding. Hence, statement (1) is correct.**
- The female carrier for haemophilia may transmit the disease to sons.
- The possibility of a female becoming a haemophilic is extremely rare.
- The family pedigree of Queen Victoria shows several haemophilic descendants as she was a carrier of the disease.

Sickle-cell anaemia:

- This is transmitted from parents to the offspring when both the partners are carrier for the gene (or heterozygous).
- In this, the mutant haemoglobin molecule undergoes polymerisation under low oxygen tension **causing the change in the shape of the RBC from biconcave disc to elongated sickle like structure. Hence, statement (2) is NOT correct.**

Thalassemia:

- This is transmitted from parents to the offspring when both the partners are unaffected carrier for the gene (or heterozygous).
- **Thalassemia differs from sickle-cell anaemia in that the former is a quantitative problem of synthesising too few globin molecules while the latter is a qualitative problem of synthesising an incorrectly functioning globin.**

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69. (a)

Explanation:

- Opioids are the drugs, which bind to specific opioid receptors present in our central nervous system and gastrointestinal tract. Example- heroin.
- **Opioids are commonly used for the treatment of pain, and include medicines such as morphine, fentanyl and tramadol. Hence, statement (1) is correct.**
- Cannabinoids are a group of chemicals which interact with cannabinoid receptors present principally in the brain.
- **The human body naturally produces cannabinoids, and these substances are called endocannabinoids. Hence, statement (2) is NOT correct.**
- **These contribute to homeostasis, which refers to stability of the internal environment of human body.**
- They are found across all vertebrate species.
- Natural cannabinoids are obtained from the inflorescences of the plant Cannabis sativa.
- The flower tops, leaves and the resin of cannabis plant are used in various combinations to produce marijuana, hashish, charas and ganja.
- Generally taken by inhalation and oral ingestion, these are known for their effects on cardiovascular system of the body.

70. (c)

Explanation:

- According to USRC (US Research Council), **biocontrol agents are natural or modified organisms, genes or a gene product used to suppress the growth of the unwanted organism** (pest/pathogen) and to enhance the growth and yield of the wanted organism (crops, microorganism, or insects). **Hence, statement (1) is correct.**
- The organic farmer holds the view that the eradication of the creatures that are often described as pests is not only possible, but also undesirable, for without them the beneficial predatory and parasitic insects would not be able to survive.
- **Thus, the use of biocontrol measures will greatly reduce our dependence on toxic chemicals and pesticides. Hence, statement (2) is correct.**
- **An example of microbial biocontrol agents that can be introduced in order to control butterfly caterpillars is the bacteria - Bacillus thuringiensis. Hence, statement (3) is correct.**
- These are available in sachets as dried spores which are mixed with water and sprayed onto vulnerable plants such as brassicas and fruit trees, where these are eaten by the insect larvae.
- In the gut of the larvae, the toxin is released, and the larvae get killed. The bacterial disease will kill the caterpillars but leave other insects unharmed.

71. (b)

Explanation:

- The cutting of DNA at specific locations became possible with the discovery of the so-called **'molecular scissors'– restriction enzymes.**
- Restriction enzymes belong to a larger class of enzymes called nucleases.
- These are of two kinds- exonucleases and endonucleases. Exonucleases remove nucleotides from the ends of the DNA whereas, **endonucleases make cuts at specific positions within the DNA. Hence, statement (2) is correct.**
- Recombinant DNA technology involves several steps in specific sequence such as isolation of DNA, **fragmentation of DNA by restriction endonucleases,** isolation of a desired DNA fragment, ligation of the DNA fragment into a vector, transferring the recombinant DNA into the host, culturing the host cells in a medium at large scale and extraction of the desired product. **Hence, statement (3) is correct.**
- **Since DNA is a hydrophilic molecule, it cannot pass through cell membranes. Hence, statement (1) is NOT correct.**

72. (b)

Explanation:

- A novel strategy to prevent infestation is based on the process of RNA interference (RNAi).
- **RNAi takes place in all eukaryotic organisms as a method of cellular defence. Hence, statement (1) is correct and statement (2) is NOT correct.**
- This method involves **silencing of a specific mRNA due to a complementary dsRNA molecule that binds to and prevents translation of the mRNA (silencing). Hence, statement (3) is correct.**
- The source of this complementary RNA could be from an infection by viruses having RNA genomes or mobile genetic elements that replicate via an RNA intermediate.

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73. (d)

Explanation:

- **Cellulose occurs exclusively in plants. Hence, statement (1) is correct.**
- **It is the most abundant organic substance in plant kingdom. Hence, statement (2) is correct.**
- It is a predominant constituent of cell wall of plant cells.
- **Cell wall of bacteria and plants is made up of cellulose.**
- We build furniture, etc. from cellulose in the form of wood and clothe ourselves with cellulose in the form of cotton fibre.
- Cellulose is a complex carbohydrate and the primary structural component in plant cell walls.
- Composed of repeating glucose units linked by β-1,4-glycosidic bonds, cellulose provides rigidity and strength to plant cells. It's a crucial dietary fibre for humans.
- **They provide raw materials for many important industries like textiles, paper, lacquers and breweries. Hence, statement (3) is correct.**

74. (c)

Explanation:

- **The generation of data sets of enormous volume and complexity is called Big Data.**
- Such data cannot be processed and analysed using traditional data processing tools as the data is not only voluminous, but also unstructured like posts, instant messages etc.
- **Big data can be structured (often numeric, easily formatted and stored) or unstructured (more free-form, less quantifiable). Hence, statement (1) is correct.**
- Big data exhibits following five characteristics that distinguish it from traditional data-
  - **Volume:** The most prominent characteristic of big data is its enormous size.
  - **Velocity:** It represents the rate at which the data under consideration is being generated and stored. **Big data has an exponentially higher rate of generation than traditional data sets. Hence, statement (2) is NOT correct.**
  - **Variety:** It asserts that a data set has varied data, such as structured, semi-structured and unstructured data. Some examples are text, images, videos, web pages and so on.
  - **Veracity:** It refers to the trustworthiness of the data because processing such incorrect data can give wrong results or mislead the interpretations.
  - **Value:** Big data is not only just a big pile of data, but also possess to have hidden patterns and useful knowledge which can be of high business value. But as there is cost of investment of resources in processing big data, we should make a preliminary enquiry to see the potential of the big data in terms of value discovery or else our efforts could be in vain. Two commonly used big data tools are **Apache Hadoop and MongoDB. Hence, statement (3) is correct.**

75. (b)

Explanation:

- Inflation targeting in India is a monetary policy framework that was adopted by the Reserve Bank of India (RBI) in 2016. Under this framework, the RBI sets a target for the inflation rate and uses monetary policy instruments to achieve it.
- Currently, RBI's primary objective is to achieve the 4% inflation target. **RBI has a comfort zone of 4 +/- 2% within which inflation must remain.** This means that the RBI aims to keep the inflation **rate between 2% and 6%. Hence, statement (1) is NOT correct.**
- **RBI's strategy of hiking interest rates is based on inflation rate in the economy. Hence, statement (2) is correct.**
- However, RBI's strategy of **hiking interest rates to control inflation** has limitations.
- According to the RBI, under the current circumstances, monetary measures alone may not be sufficient to control inflation. Fiscal policy (government's taxes and spending) may be more effective in bringing down current inflation.

76. (b)

Explanation:

- An **Infrastructure Investment Trust (InvITs)** is a collective Investment Scheme similar to a mutual fund, which enables direct investment of money from individual and institutional investors in **infrastructure projects** to earn a small portion of the income as a return. **Hence, statement (1) is correct.**

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- InvITs are listed on exchanges just like stocks — through Initial Public Offering (IPO).
- InvITs are regulated by the Securities and Exchange Board of India (SEBI) (Infrastructure Investment Trusts) Regulations, 2014.
- **Real estate Investment Trusts (REITs)** refers to an entity created with the sole purpose of channeling investible funds into operating, owning or financing **income-producing real estate. Hence, statement (2) is correct.**
- REITs are modeled on the lines of mutual funds and provide investors with an extremely liquid way to get a stake in real estate.
- It is a type of security that provides all types of investors, big or small, with an outlet for regular income, portfolio diversification, and long-term capital appreciation.
- **Like any other security, REITs can enlist themselves on a stock exchange. Hence, statement (3) is NOT correct.**
- In India, the REIT were introduced by the **SEBI** in 2007.

77. (b)

Explanation:

- The entry at serial No. 23 of **List II (State List)** to the Constitution of India mandates the state government to own the minerals located within their boundaries. **Hence, statement (1) is correct.**
- The entry at serial No. 54 of **List I (Central List)** mandates the central government to own the minerals within the exclusive economic zone of India (EEZ). **Hence, statement (2) is correct.**
- In pursuance to this Mines & Minerals (Development and Regulation) (MMDR) Act of 1957 was framed. The Act mandates that the Union should take under its control the regulation of mines and the development of minerals.
- A joint venture company namely Khanij Bidesh India Ltd. (KABIL) is to be set up with the participation of three Central Public Sector Enterprises namely, National Aluminium Company Ltd.(NALCO), Hindustan Copper Ltd.(HCL) and Mineral Exploration Company Ltd. (MECL).
- The objective of constituting KABIL is to ensure a consistent supply of critical and strategic minerals to Indian domestic market. While KABIL would ensure mineral security of the Nation, it would also help in realizing the overall objective of import substitution. **Hence, statement (3) is NOT correct.**

78. (b)

Explanation:

- The **Ministry of Mines,** Government of India recently unveiled the first-ever report on "**Critical Minerals** for India" prepared by an expert team constituted by the Ministry of Mines.
- Critical minerals are those **minerals that are essential for economic development and national security,** the **lack of availability of these minerals or concentration of extraction or processing in a few geographical locations may lead to supply chain vulnerabilities** and even disruption of supplies.
- **Expert Committe** under Ministry of Mines has identified a set of **30 critical minerals for India. Hence, statement (1) is NOT correct.**
- These are Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.
- **Creation of Centre of Excellence for Critical Minerals (CECM)** in the Ministry of Mines is also recommended by the Committe.
- CECM will **periodically update the list of critical minerals for India** and notify the critical mineral strategy from time to time.
- Industries such as **high-tech electronics, telecommunications, transport, and defense heavily rely on these minerals.**
- Additionally, **critical minerals are essential for green technologies like solar panels, wind turbines, batteries, and electric vehicles. Hence, statement (2) is correct.**

79. (b)

Explanation:

- A **semiconductor** is a substance that has specific electrical properties that enable it to serve as a foundation for computers and other electronic devices.
- A substance that can conduct electricity is called the conductor and a substance that cannot conduct electricity is known as the insulator. Semiconductors have properties that sit between the conductor and insulator. **A diode, integrated circuit (IC) and transistors are all made from semiconductors. Hence, statement (2) is correct.**

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- Elemental semiconductors include **antimony, arsenic, boron, carbon, germanium, selenium, silicon, sulfur and tellurium.** Silicon is the best known of these, forming the basis of most ICs.
- Common semiconductor compounds include **gallium arsenide, indium antimonide and the oxides of most metals.** We also widely use **gallium arsenide** (GaAs) in low-noise, high-gain, weak-signal amplifying devices. **Hence, statement (1) is NOT correct.**
- A semiconductor device can perform the function of the original vacuum tube, but with hundreds of times its volume. Like a microprocessor chip, a single IC can do the work of a set of vacuum tubes that would fill a large building and require its own electricity generating plant.

80. (a)

Explanation:

- In a joint effort, **the Ministry of Power and the Ministry of New and Renewable Energy** have announced the launch of a new National Mission called **"Mission on Advanced and High-Impact Research (MAHIR)." Hence, statement (3) is NOT correct.**
- This initiative aims to identify and develop emerging technologies in the power sector **within and outside of India. Hence, statement (1) is NOT correct.**
- The mission's primary goal is to promote indigenous research, development, and demonstration of **advanced power technologies,** positioning India as a global manufacturing hub.
- It aligns with national priorities such as achieving **Net Zero emissions,** supporting initiatives like **Make in India and Start-up India,** and contributing to **the United Nations Sustainable Development Goals (SDGs). Hence, statement (2) is correct.**
- MAHIR will establish a two-tier structure comprising **a Technical Scoping Committee (TSC)** and **an Apex Committee.**
- The TSC, led by the **Chairperson of the Central Electricity Authority,** will identify emerging research areas globally, recommend potential technologies, and monitor approved research projects.
- The Apex Committee, chaired by **the Union Minister for Power & New and Renewable Energy,** will deliberate on technology and product development, approve research proposals, and explore international collaborations.
- The Mission has initially identified eight areas for research, including alternatives to Lithium-Ion storage batteries, modifying electric cookers for Indian cooking methods, green hydrogen for mobility, carbon capture, geo-thermal energy, solid-state refrigeration, nano-technology for EV batteries, and indigenous CRGO technology.

81. (b)

Explanation:

- The **KAVACH** is an **indigenously developed** Automatic Train Protection (ATP) system by the Research Design and Standards Organization (RDSO) in collaboration with the Indian industry. **Hence, statement (1) is NOT correct.**
- 'Kavach' is one of **the cheapest,** Safety Integrity Level-4 (SIL-4) standards certified technologies where the **probability of error is 1 in 10,000 years. Hence, statement (2) is correct.**
- The Traffic collision avoidance system (TCAS), with the help of equipment on board the locomotive and transmission towers at stations connected with **Radio Frequency Identification (RFID) tags,** helps in two-way communication between the station master and loco pilot to convey any emergency message.
- The instrument panel inside the cabin helps the loco pilot know about the signal in advance without visual sighting, and the permissible speeds to be maintained. If a red signal is jumped and two trains come face to face on the same line, the technology automatically takes over and applies sudden brakes. Additionally, the hooter activates by itself when approaching a level crossing **which serves as a big boon to loco pilots during fog conditions when visibility is low. Hence, statement (3) is correct.**

82. (c)

Explanation:

- Mr. Shaktikanta Das, Reserve Bank of India (RBI) Governor, launched a **financial inclusion dashboard named 'Antardrishti'.**
- The dashboard will, as its name implies, give the required knowledge **to assess and monitor the growth of financial inclusion** by recording pertinent data. This tool will also make it possible to assess the degree of financial exclusion at a local level across the nation so

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that such places may be addressed. This facility will also enable to gauge the extent of financial exclusion at granular levels across the country so that such areas can be addressed. **Hence, option (c) is correct.**

- The dashboard, presently intended for internal use in the RBI, will further facilitate greater financial inclusion through a multi-stakeholder approach.
- The Reserve Bank has been supporting financial inclusion by implementing a number of policy initiatives and the launch of Antardrishti' is another step in this direction.

83. (c)

Explanation:

- Hon'ble Finance Minister, Smt. Nirmala Sitharaman has announced an outlay of INR 1.97 Lakh Crores for **the Production Linked Incentive (PLI) Schemes** across **14 key sectors, to create national manufacturing champions** and to create 60 lakh new jobs, and an additional production of 30 lakh crore during next 5 years.
- These sectors are part of PLI scheme -
  - **Included in March 2020**
    - **Pharmaceuticals**
    - Large Scale Electronics Manufacturing
    - Manufacturing of Medical Devices
  - **Included in November 2020:**
    - Electronic/Technology Products
    - Telecom & Networking Product- **miconductors** and display manufacturing
    - **Food Products:** Ready to Eat / Ready to Cook
    - White Goods (ACs & LED)
    - High-Efficiency Solar PV Modules, **LED Lighting Products LED Chips,**
    - Advance Chemistry Cell (ACC) Battery
    - Textile Products: MMF Apparel, MMF Fabrics and Products of **Technical Textiles**
    - Specialty Steel
  - **Included in September 2021**
    - Drones and Drone Components
- **Media and entertainment** along with **tourism** are part of **the service sector** and the Production linked Incentive scheme is focusing on Manufacturing and production.

Hence, option (c) is correct.

84. (b)

Explanation:

- **Curd, lemon juice, orange** juice and vinegar taste **sour.**
- These substances taste sour because they contain acids. The chemical nature of such substances is acidic.
- The word acid comes from the Latin word acere which means sour. The acids in these substances are natural acids.
- Acids are sour in taste.
- **Acid turns blue litmus red.** Bases turn red litmus blue.
- Substances which are neither acidic nor basic are called neutral.
- Solutions of substances that show different colour in acidic, basic and neutral solutions are called indicators.
- Acid and a base neutralise each other and form a salt. Salt may be acidic, basic or neutral in nature.

Name of acid	Found in
Acetic acid	**Vinegar**
Formic acid	**Ant's sting**
Citric acid	Citrus fruits such as oranges, lemons, etc.
Lactic acid	Curd
Oxalic acid	Spinach
Ascorbic acid (Vitamin C)	Amla, Citrus fruits
Tartaric acid	**Tamarind,** grapes, unripe mangoes, etc.

Hence, pair (2) and (3) are correctly matched. Whereas pair (1) and (4) are NOT correctly matched.

85. (d)

Explanation:

- **Vegetative propagation** is a type of asexual reproduction in which new plants are produced from **roots, stems, leaves** and **buds. Hence, statement (3) is correct.**
- Since reproduction is through the **vegetative parts** of the plant, it is known as vegetative propagation.
- Plants produced by vegetative propagation take less time to grow and bear flowers and fruits earlier than those produced from seeds.
- The new plants are exact copies of the parent plant, as they are produced from a single parent

There are several ways by which plants produce their offspring. These are categorised into two types:

(i) Asexual reproduction.
(ii) Sexual reproduction.

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- In asexual reproduction plants can give rise to new plants without seeds, whereas in sexual reproduction, new plants are obtained from seeds. **Hence, statement (1) and (2) are correct.**
- Asexual reproduction in plants occurs through budding, fragmentation, vegetative propagation, and spore formation. No flowers are required for this method. The plants produced by asexual reproduction thrive well in stable environments.
- Most of the flowering plants reproduce sexually. The flower is the reproductive part of a plant i.e., both male and female gametes are produced by flowers. Sexual reproduction in plants takes place in flowers.

86. (a)

Explanation:

- A change in which one or more **new substances** are **formed** is called a **chemical change.** A chemical change is also called a chemical reaction. Chemical changes are very important in our lives. All new substances are formed as a result of chemical changes. For example, **digestion of food** in our body, **ripening of fruits**, **fermentation of grapes,** etc., happen due to series of chemical changes.
- A **change** in which a substance undergoes a change in its **physical properties** is called a physical change. A physical change is generally reversible. In such a change no new substance is formed
- **Electroplating:** The process of electroplating involves a **chemical change.** It uses electrical current to deposit a layer of one metal onto the surface of another. This is commonly used in **jewellery, automotive parts**, and **electronics manufacturing.**
- **Baking:** Baking involves various **chemical reactions.** For example, when you bake bread, the **yeast ferments the sugars,** producing carbon dioxide gas, which causes the dough to rise. The Maillard reaction also occurs, giving baked goods their distinctive flavor and color.
- **Crushing or Grinding:** Breaking a solid into smaller pieces doesn't alter its chemical composition. For example, crushing rocks into gravel or **grinding coffee beans into coffee grounds** are **physical changes.**
- **Sublimation:** Some substances **can change directly from a solid to a gas** without going through a liquid phase. **Dry ice** (solid carbon dioxide) is an example. **Hence, option (a) is correct.**

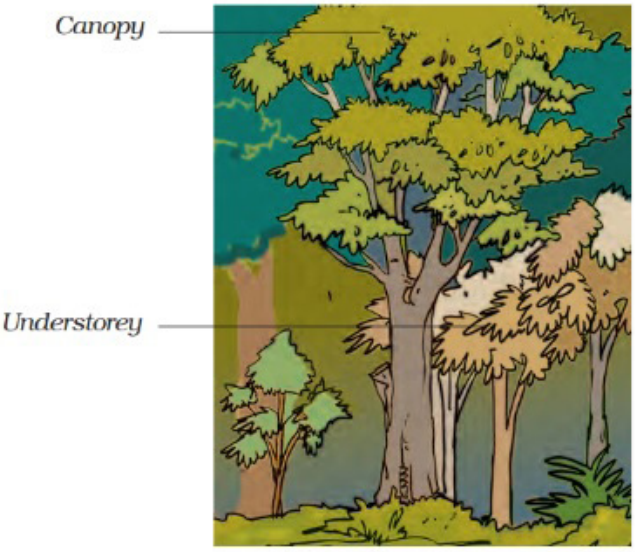
87. (c)

Explanation:

- The **upper branchy part** of the tree above the bole is called crown. **Hence, statement (1) is correct.**
- A tree canopy is the **top portion of a tree composed of branches and leaves** or needles. **Hence, statement (2) is correct.**
- All trees have canopies, and all trees cast shade.
- But trees with tall trunks and dense, wide-spreading lateral branches create canopies that cast enough cooling shade to moderate the local environment, reducing temperatures in the shaded area by as much as 20 degrees.

Canopy Density:

- **Forest Canopy Density** (FCD) refers to the **proportion of an area in the field/ground that is covered by the crown of trees** and is expressed in percentage of the total area.



88. (d)

Explanation:

- Generally, **pollen grains** have a tough protective coat which prevents them from drying up. Since pollen grains are **light,** they can be carried by **wind or water.**
- **Insects** visit flowers and carry away pollen on their bodies. Some of the pollen lands on the stigma of a flower of the same kind. The transfer of pollen from the anther to the stigma of a flower is called pollination.

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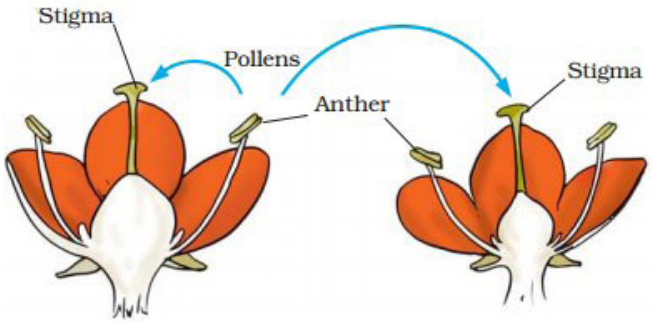
- If the pollen lands on the stigma of the same flower or another flower of the same plant, it is called self-pollination.
- When the pollen of a flower lands on the stigma of a flower of a different plant of the same kind, it is called cross-pollination.
- When a **pollen grain** moves from the **anther** (male part) of a flower to the **stigma** (female part), pollination happens and it is the **first step in a process that produces seeds,** fruits, and the next generation of plants.
- This can happen through **self-pollination, wind and water pollination or through pollinators.**

Pollinators:

- **Vectors that move pollen within the flower and from flower to flower** are called pollinators.
- They visit flowers to drink nectar or feed off pollen and transport pollen grains as they move from spot to spot.
- There are **two categories** of pollinators:
  - **Invertebrate pollinators:** Include **bees, moths, flies, wasps, beetles** and **butterflies.**
  - **Vertebrate pollinators:** Include **monkeys, rodents, lemurs, tree squirrels, bats, hummingbird.**

Hence, option (d) is correct.



Pollination in flower

89. (a)

Explanation:

- The **normal temperature** of the **human body** is **37°C.**
- The heat flows from a body at a higher temperature to a body at a lower temperature.
- There are three ways in which heat can flow from one object to another.
- These are conduction, convection and radiation.
- In **solids,** generally, the heat is transferred by **conduction.**
- In **liquids** and **gases,** the heat is transferred by **convection.**
- **No medium** is required for transfer of heat by **radiation.**
- The materials which allow heat to **pass** through them easily are conductors of heat. **Hence, statement (1) is correct.**
- The materials which **do not allow** heat to pass through them easily are called **insulators. Hence, statement (2) is correct.**
- **Dark-coloured** objects **absorb more heat** than the light-colored objects. **Hence, statement (3) is NOT correct.**
- That is the reason we feel more comfortable in light-coloured clothes in the summer.
- Woollen clothes keep us warm during winter.
- It is so because wool is a poor conductor of heat, and it has air trapped in between the fibres.

90. (a)

Explanation:

- A tissue is a group of cells that perform specialised function in an organism. **Hence, statement (1) is correct.**
- Plants have pipe-like vessels to transport water and nutrients from the soil. The vessels are made of special cells, forming vascular tissue.
- The vascular tissue for the **transport of water and nutrients** in the plant is called the **xylem.** It also provides structural support. **Hence, statement (2) is NOT correct.**
- The xylem forms a continuous network of channels that connects roots to the leaves through the stem and branches and thus transports water to the entire plant
- The **food** has to be transported to all parts of the plant. This is done by the vascular tissue called the **phloem.** It consists of sieve tubes and companion cells, facilitating bidirectional flow. Together, xylem and phloem support plant growth and function. **Hence, statement (3) is NOT correct.**
- Thus, xylem and phloem transport substances in plants.

91. (c)

Explanation:

- The small intestine is highly coiled and is about 7.5 metres long.
- It receives secretions from the liver and the pancreas. Besides, its wall also secretes juices.

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- The **liver** is a reddish-brown gland situated in the upper part of the abdomen on the right side.
- It is the **largest gland** in the body. It secretes **bile juice** that is stored in a sac called the **gall bladder. Hence, statement (1) is correct.**
- The bile plays an important role in the digestion of fats. **Hence, statement (2) is correct.**
- The pancreas is a large cream coloured gland located just below the stomach.
- Pancreatic juice acts on carbohydrates, fats and proteins and changes them into simpler forms.

92. (c)

Explanation:

- The waste which is present in the blood has to be removed from the body.
- A mechanism to filter the blood is required. This is done by the blood capillaries in **the kidneys.**
- When the blood reaches the two kidneys, it contains both useful and harmful substances.
- The useful substances are absorbed back into the blood. The waste dissolved in water is removed as urine.
- From the kidneys, the urine goes into the urinary bladder through tube-like ureters.
- It is stored in the bladder and is passed out through the urinary opening at the end of a muscular tube called urethra.
- The **kidneys, ureters, bladder and urethra** form the excretory system.
- **Nephron** is the functional unit of the kidney responsible for filtering blood and producing urine. **Hence, statement (2) is correct.**
- The functional unit of the excretory system in most invertebrates is called the **Malpighian** tubule. **Hence, statement (1) is correct.**

93. (c)

Explanation:

- Respiration is essential for survival of living organisms. It releases energy from the food.
- The **oxygen we inhale** is used to **breakdown glucose into carbon dioxide and water.**
- The breakdown of glucose occurs in the cells of an organism (cellular respiration).
- If the food is broken down with the use of oxygen, it is called aerobic respiration. If the breakdown occurs without the use of oxygen, the respiration is called anaerobic respiration.
- During heavy exercise when the supply of oxygen to our muscle cells is insufficient, food breakdown is by anaerobic respiration.
- Breathing is a part of the process of respiration during which an organism takes in the oxygen-rich air and gives out air rich in carbon dioxide.
- The respiratory organs for the exchange of gases vary in different organisms.
- During inhalation, our lungs expand and then come back to the original state as the air moves out during exhalation.
- Increased physical activity enhances the rate of breathing.
- In animals like cows, buffalo, dog and cat the respiratory organs and the process of breathing are similar to those in humans.
- In earthworms, the exchange of gases occurs through the moist skin. **Hence, statement (1) is correct.**
- In fishes it takes place through gills and in insects through the tracheae. **Hence, statement (2) is correct.**

94. (c)

Explanation:

- Curd contains several microorganisms.
- Of these, the bacterium, Lactobacillus promotes the formation of curd. **Hence, statement (1) is correct.**
- It multiplies in milk and converts it into curd.
- Bacteria are also involved in the making of **cheese, pickles and many other food items.**
- An important ingredient of rava (sooji) idlis and bhaturas is curd.
- Bacteria and yeast are also helpful for fermentation of rice idlis and dosa batter. **Hence, statement (2) is correct.**
- Yeast reproduces rapidly and produces carbon dioxide during respiration. Bubbles of the gas fill the dough and increase its volume. This is the basis of the use of yeast in the baking industry for making breads, pastries and cakes.

95. (c)

Explanation:

- **Anthrax** is an infection caused by the spore-forming **bacteria** called Bacillus anthracis. It is a zoonosis **(disease transmissible from animals to humans)** that typically affects ruminants (such as **cows, sheep, and goats). Hence, statement (1) is correct.**

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- The bacteria produce extremely potent toxins which are responsible for the symptoms, causing a high lethality rate. Humans can catch diseases from infected animals or through contaminated animal products.
- **Foot-and-mouth disease (FMD),** also called **hoof-and-mouth disease** or **aftosa**, a **highly contagious viral disease** affecting practically all cloven-footed domesticated mammals, including cattle, sheep, goats, and pigs. Wild herbivores such as bison, deer, antelopes, reindeer, and giraffes are also susceptible. The horse is resistant to the infection. **Hence, statement (2) is correct.**

96. (c)

Explanation:

- Soil needs replenishment and enrichment through the use of organic manure and fertilisers.
- Use of chemical fertilisers has increased tremendously with the introduction of new crop varieties.
- Supply of water to crops at appropriate intervals is called irrigation.
- Weeding involves removal of unwanted and uncultivated plants called weeds.
- **Harvesting** is the cutting of the mature crop manually or by machines. **Hence, statement (3) is correct.**
- Separation of the grains from the chaff is called **threshing. Hence, statement (2) is NOT correct.**
- Proper storage of grains is necessary to protect them from pests and microorganisms.
- Food is also obtained from animals for which animals are reared. This is called animal husbandry.
- **The process of loosening and turning of the soil is called tilling.** Tillage is the manipulation of the soil into a desired condition by mechanical means; tools are employed to achieve some desired effect. **Hence, statement (1) is correct.**

97. (d)

Explanation:

- **Sensors are very commonly used for monitoring and observing elements in real world applications.**
- The evolution of smart electronic sensors is contributing in a large way to the evolution of IoT.
- It will lead to creation of new sensor-based, intelligent systems.
- A smart sensor is a device that takes input from the physical environment and uses built-in computing resources to perform predefined functions upon detection of specific input and then process data before passing it on.
- **Example- the sensors present in the mobile phones.**
- The display in the mobile phone changes to vertical or horizontal with respect to the way we hold our mobile.
- This is possible with the help of two sensors, namely accelerometer and gyroscope (gyro).
- **The accelerometer sensor in the mobile phones detects the orientation of the phone. The gyroscope sensors track rotation or twist of your hand and add to the information supplied by the accelerometer. Hence, statement (1) and (2) are NOT correct.**

98. (d)

Explanation:

- Cloud computing is an emerging trend in the field of information technology, **where computer-based services are delivered over the Internet or the cloud, for the case of their accessibility from anywhere using any smart device. Hence, statement (1) is NOT correct.**
- The services comprise software, hardware (servers), databases, storage, etc.
- **Pay-as-you-go cloud computing (PAYG cloud computing) is a payment method for cloud computing services that charges based on usage. The practice is similar to that of utility bills, using only resources that are needed.** However, services such as Gmail, Google Drive functions on Software as a service platform are usually free of cost. **Hence, statement (2) is NOT correct.**
- When you use cloud computing, data backups are centralized in the cloud providers' data centres, removing the need for individual users or teams to maintain their own backups onsite or offsite. **This lower (but not completely eliminates) the risk of data loss should any one backup fail or be destroyed by a disaster. Hence, statement (3) is NOT correct.**

99. (c)

Explanation:

- Natural gas is a very important fossil fuel because it is easy to transport through pipes.

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- Natural gas is stored under high pressure as **compressed natural gas** (CNG). CNG is used for power generation.
- Natural gas is primarily composed of **methane** and is considered a **clean-burning fossil fuel. Hence, statement (2) is correct.**
- It is now being used as a fuel for transport vehicles because it is less polluting. It is a cleaner fuel.
- The great advantage of CNG is that **it can be used directly for burning** in homes and factories where it can be supplied through pipes.
- Such a network of pipelines exists in Vadodara (Gujarat), some parts of Delhi and other places.
- Natural gas is also used as a starting material for the manufacture of a number of **chemicals** and **fertilisers.**
- India has vast **reserves of natural gas.** In our country, natural gas has been found in **Tripura, Rajasthan, Maharashtra** and in the Krishna Godavari delta.
- The process of **converting natural gas into a liquid form** for easier transportation and storage is called **liquefaction. Hence, statement (1) is correct.**

100. (d)

Explanation:

- An artificial satellite is a **human-made object** placed into orbit around a celestial body, most commonly the Earth.
- Artificial satellites can be classified as **geostationary or low Earth orbit, satellites,** depending on their altitude and function, contributing to technological advancements and enhancing the understanding of the cosmos.
- They are launched from the Earth.
- They revolve around the Earth much closer than earth's natural satellite, the moon.
- India has built and launched several artificial satellites.
- **Aryabhata** was the **first Indian satellite.** Some other Indian satellites are INSAT, IRS, Kalpana-1, EDUSAT, etc.
- Artificial satellites have many practical applications.
- They are used for **forecasting weather, transmitting television and radio signals. They are also used for telecommunication and remote sensing.**

Hence, option (d) is correct.

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